

AD-A953 739

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INVENTORY

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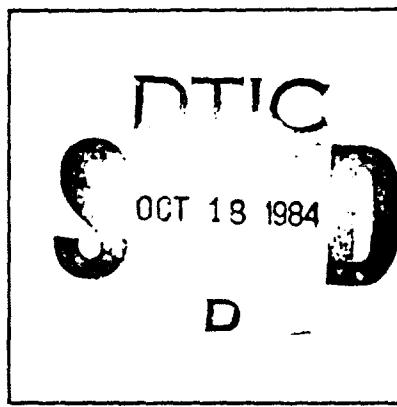
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AD-A953 739

WINGS OF MILITARY VEHICLES DROPPED IN THE DOKUZUYUKI

OF HELLON STREET CLOUDS

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~~SECRET~~
~~REF ID: A6510~~

This is a collection of curves of the successive dilations with pressure at various points in hollow steel cylinders of various dimensions, wall ratios, and heat treatments. These constitute the original experimental data upon which are based the practical calculations involved in the cold working or auto-frettage of cannon at Watertown and Watervliet Arsenals.

They were prepared about 1925 by Mr. (now Colonel) J. C. Solberg, Capt. (now Brig.Gen.) Donald Armstrong, and Capt. Thomas Conrad, under the direction of Dr. F. C. Langenberg. Original experimental data and calculations are contained in WAL Reports Nos. 217, 220, 223, 224, 225, and 251.

The attached curves were photographed from the original plots of data observed in the development phases of the Cold Work Process as used at Watertown and Watervliet Arsenals. The photographs were made to preserve the work which was recorded on a heavy graph paper that was embrittled with age and becoming much the worse for wear.

A few of the curves contained herein were published and the highlights of these tests were made available in other reports that exist in the Laboratory files. It was felt desirable to preserve the details of the tests so that needless repetitive work would be avoided.

The original data from which these graphs were made is tabulated in ink on linen cloth in the Engineering files. The drawing numbers of the tabulations are noted in the photographs.

D. H. NEWHALL
Captain, Ord. Dept.

Watertown Arsenal
Watertown, Massachusetts
14 June 1944

EXHIBIT 20

WTN 630-6760

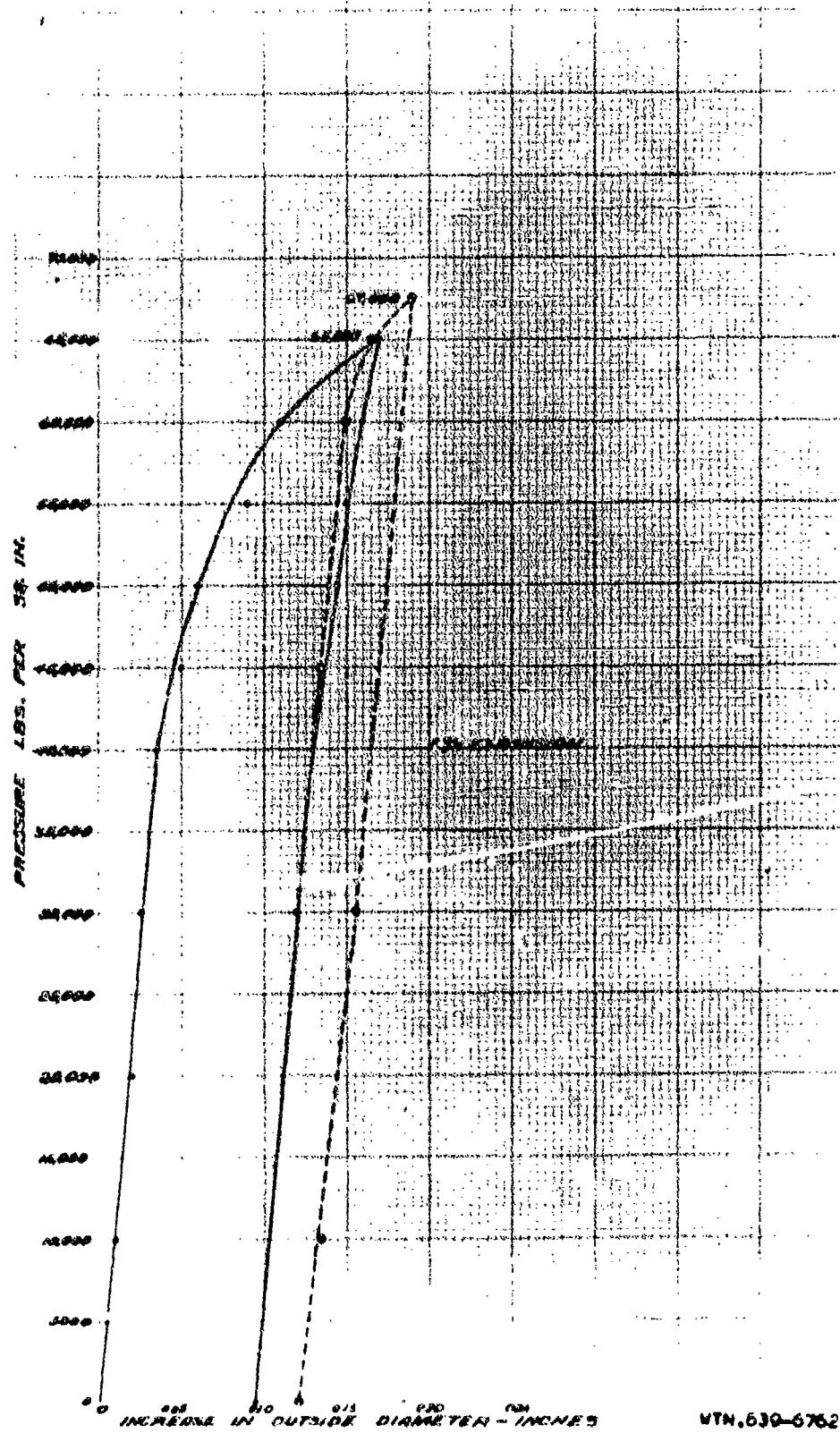
SUCCESSIVE DILATATIONS
3.9 MEDIUM GRINDER
3 POINT C
at 1000 rpm

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10

WTN.619-6765

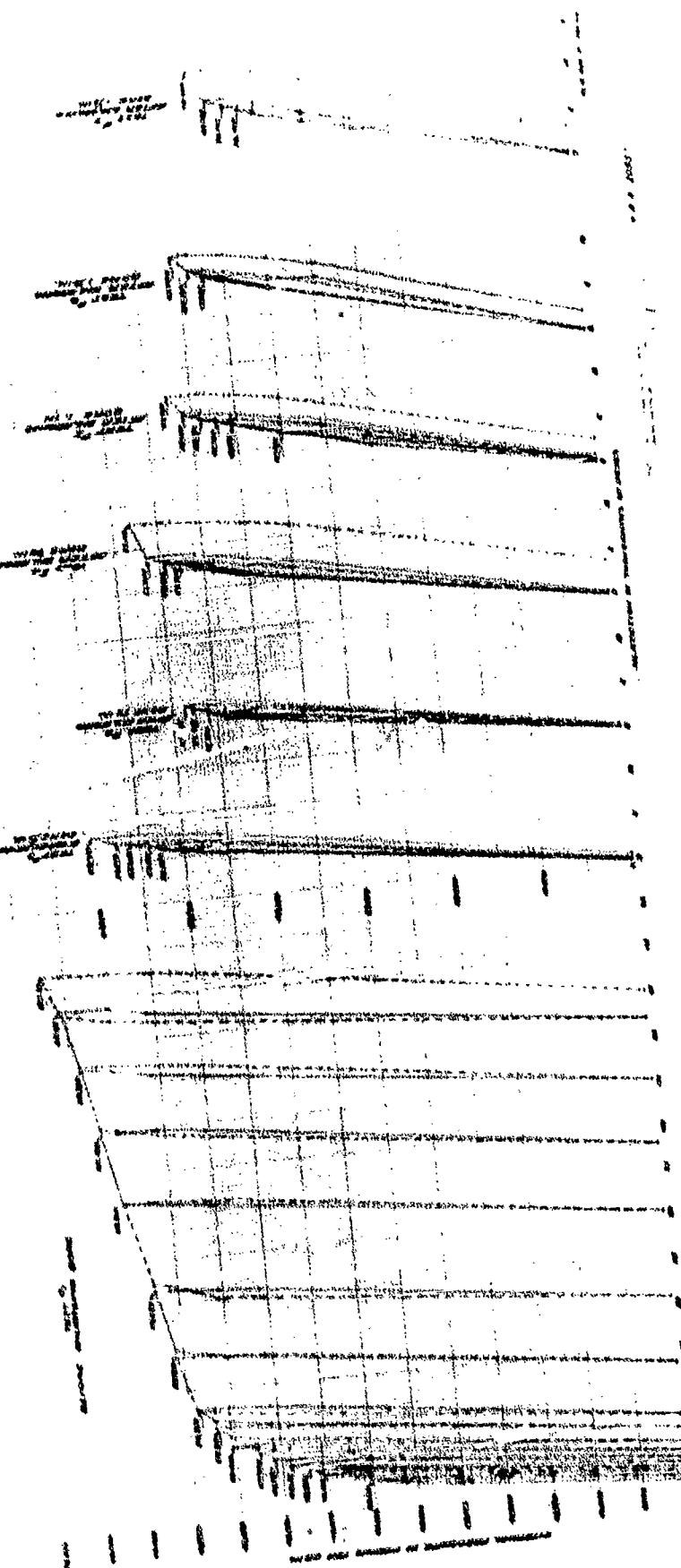
INTERMITTENT TREATMENT PROGRAM
CYLINDER #2



INCREASE IN OUTSIDE DIAMETER - INCHES

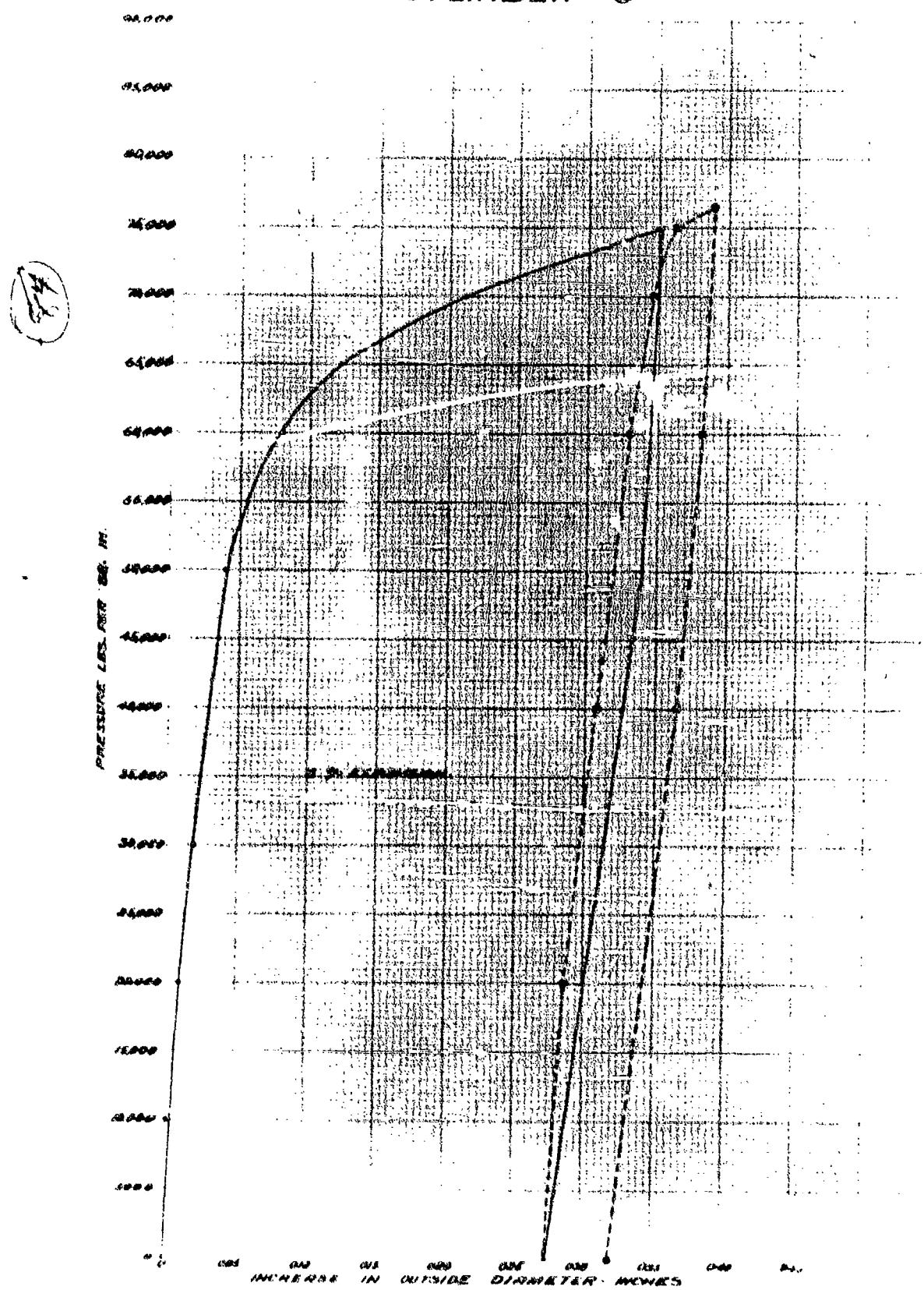
WTM.630-6762

SUCCESSIVE CHARTS
300 METRE CHARGE
OF FRONT C



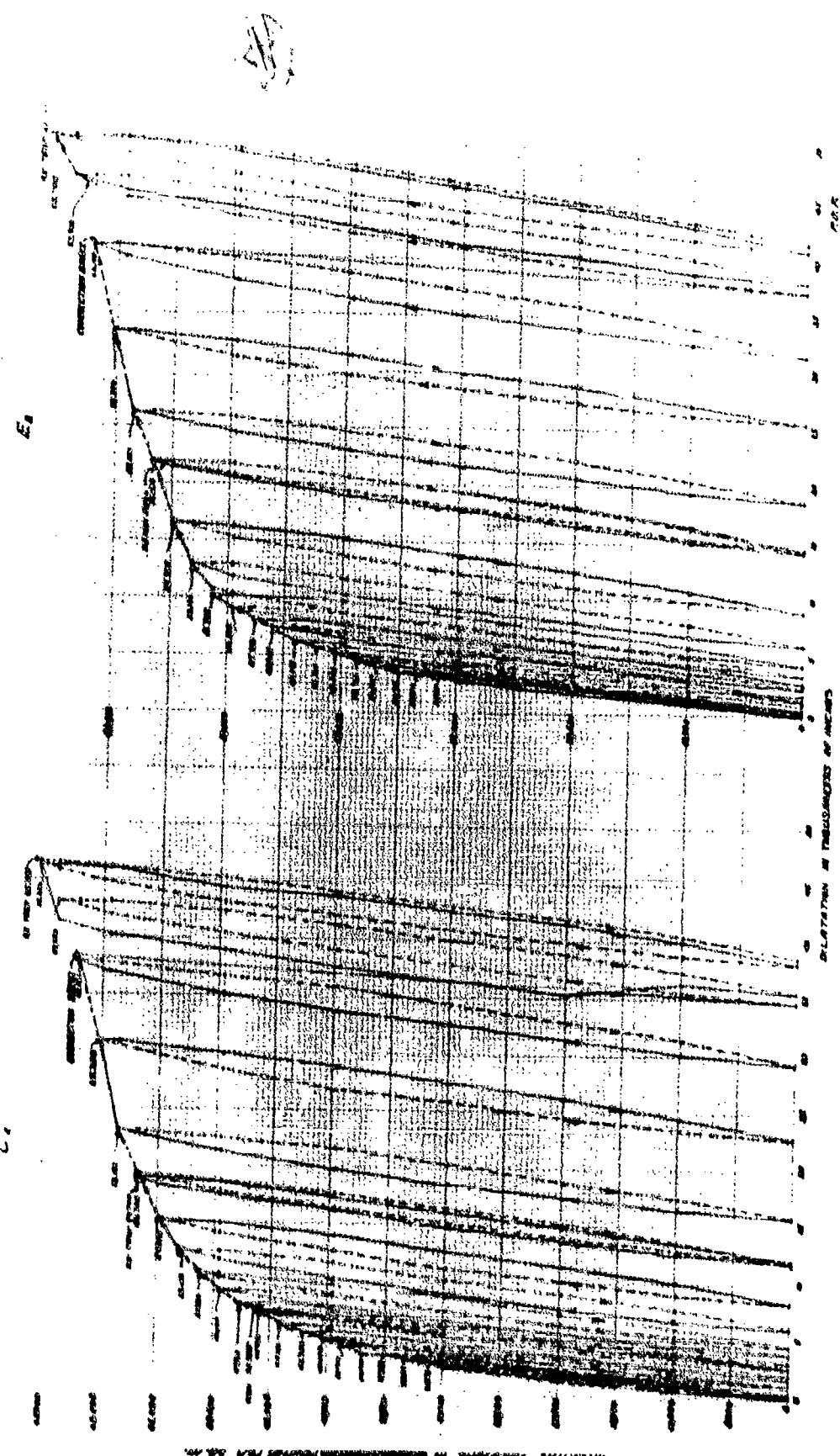
EN. 6761

INTERMEDIATE TREATMENT PROGRAM
CYLINDER #3



WTN.630-6773

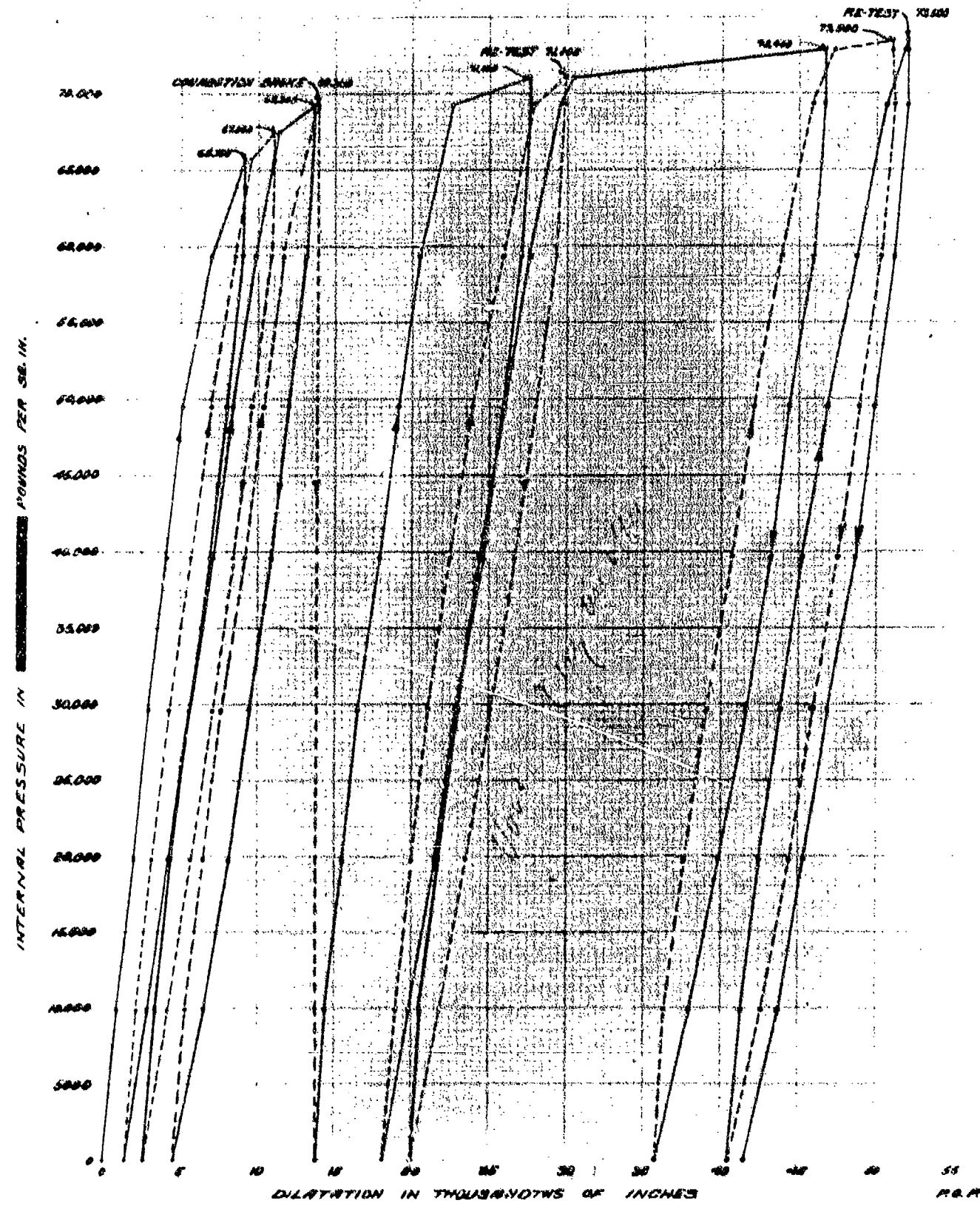
CHIMERA 3 TEST 3
SUCCESSIVE DILUTIONS
 3×7.5 HOLLOW CYLINDER
AT POINT C₃ - E₃
INJECTION AT 0.0000 MM



VTM-639-6706

(18)

CYLINDER #3 - TEST #2
SUCCESSIVE DILATATIONS
 OF
3 X 7.5 HOLLOW CYLINDER
 AT POINT D_E
 TABULATION ON DR. NO. 9 - 50635-A

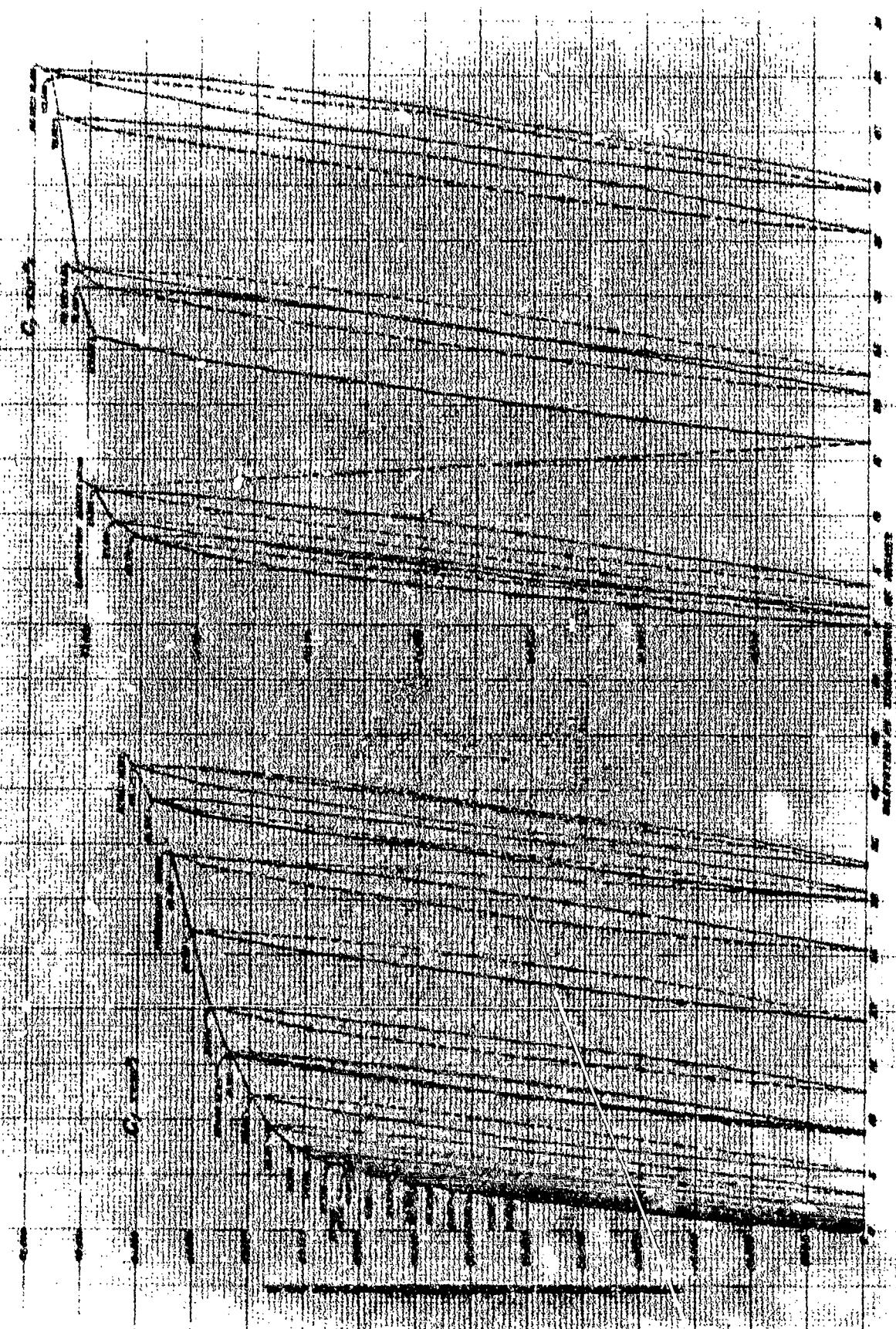


WTN.639-6707

55
P.S.I.

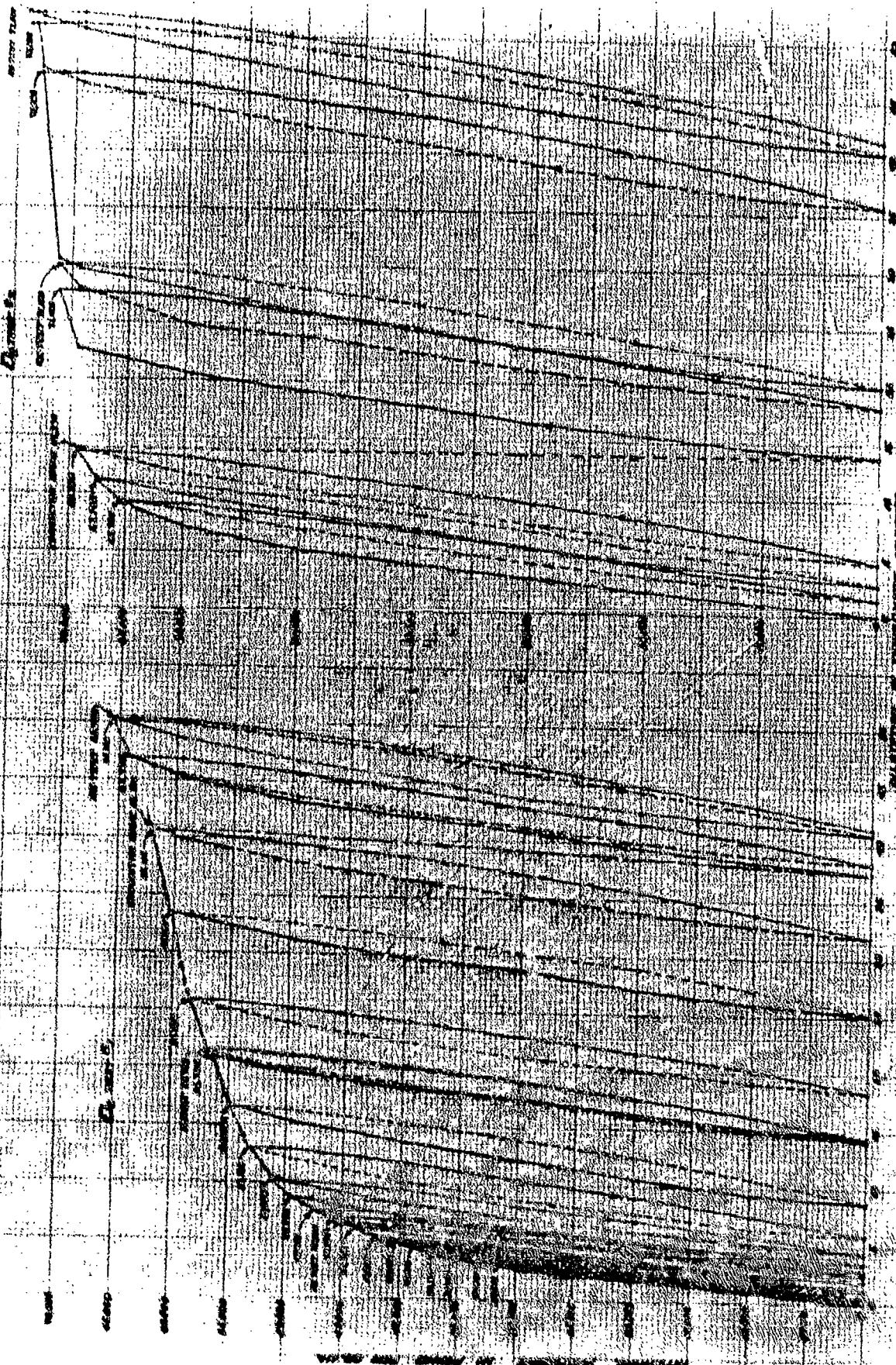
CHARGE 2 REAR 1
SECOND SIGHT BLASTERS
3 PT. ABL. LIGHT Cylinders
3 PT. POINT CYLINDERS

(5)



WTN.632-6742

(8)



SUCCESSIVE EXPOSURE
PROJECTION GROWING
BY POINTS

EN. 630-6700

WTH.632-6737

48

STANDARD
EFFECTIVE DISTANCE

SUCCESSIVE DILATATIONS
3 X 7.5 HOLLOW CYLINDER
AT POINTS B, C, & D

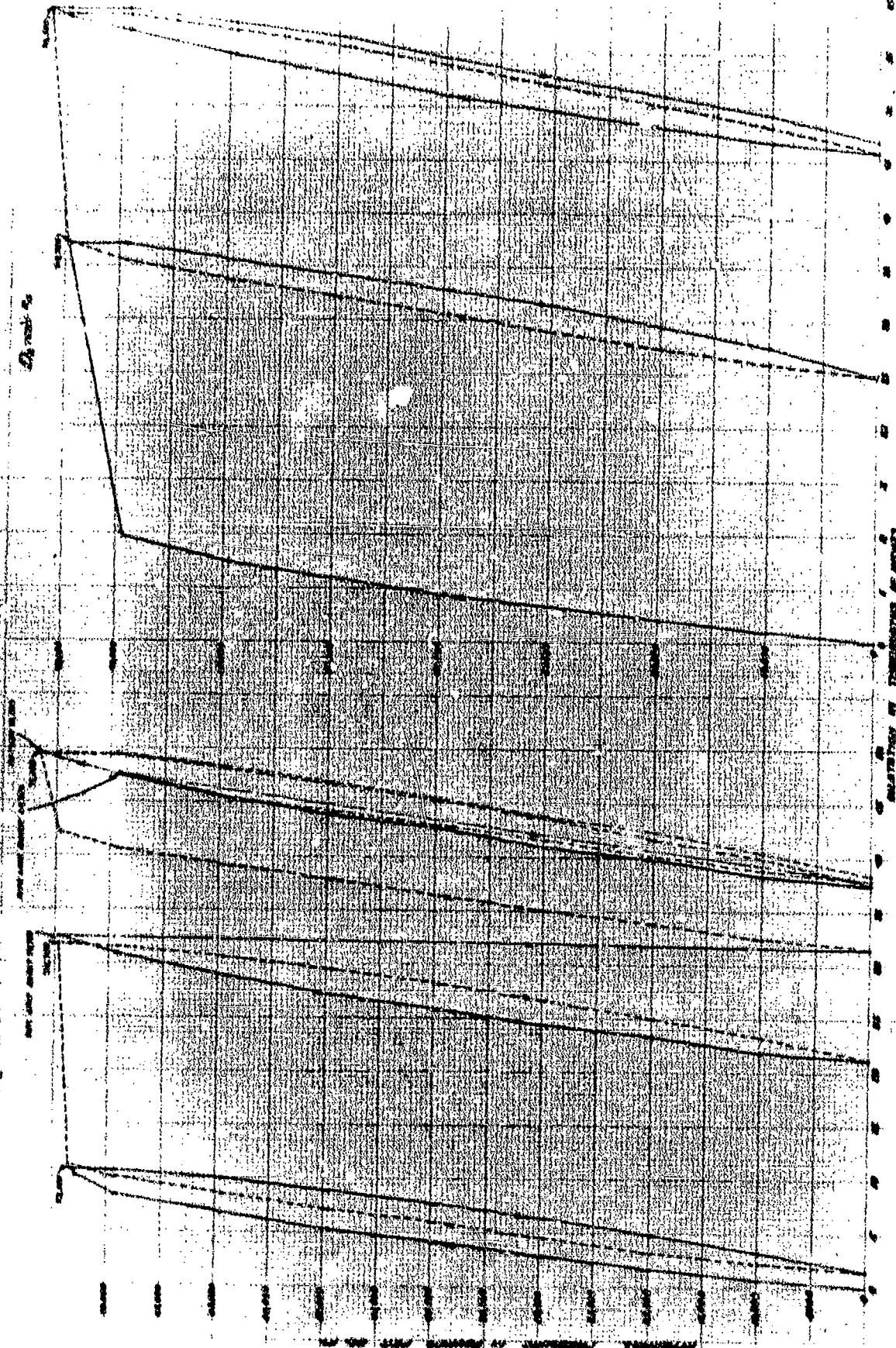
TEST 3
D₂

TEST 2
D₁

(19)

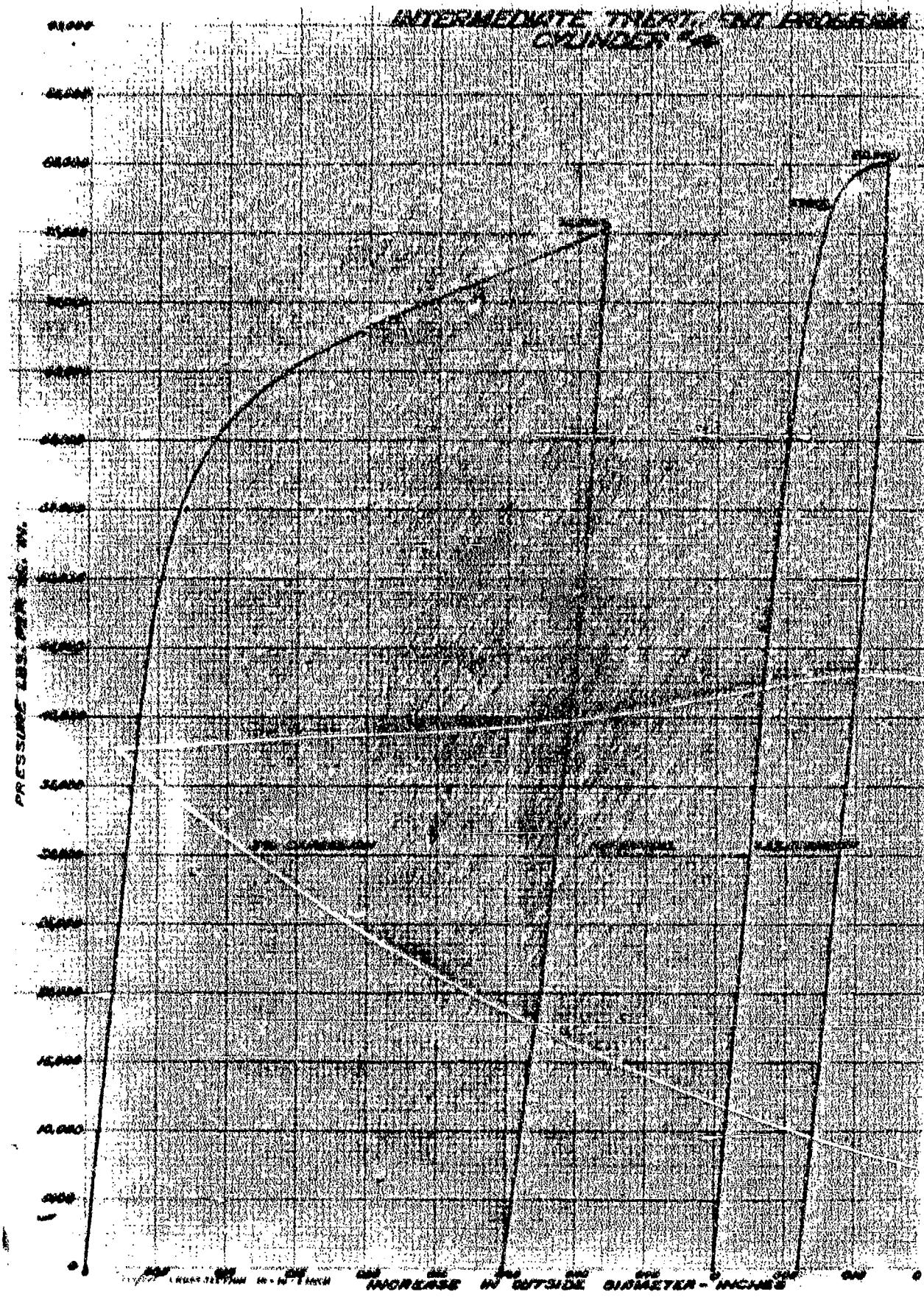
VIN.630-6703

(6)



SUCCESSION OF TESTS
3 X 7.5 HOLLOW CHAMBERS
AT PUFF D

WTN.63D-6710



WTN.639-6726

(21)

49

STRESSING OR CRATING
275 HZ ON CYLINDER
PART C-2100-1000

WTN.639-6736

CHAMBER TEST 7-1
SUCCESSIONAL DILATATION
3x75 HOLLOW CYLINDER
AT 80°F & 100% RH - 1000 HOURS

RE

WTN.630-6704

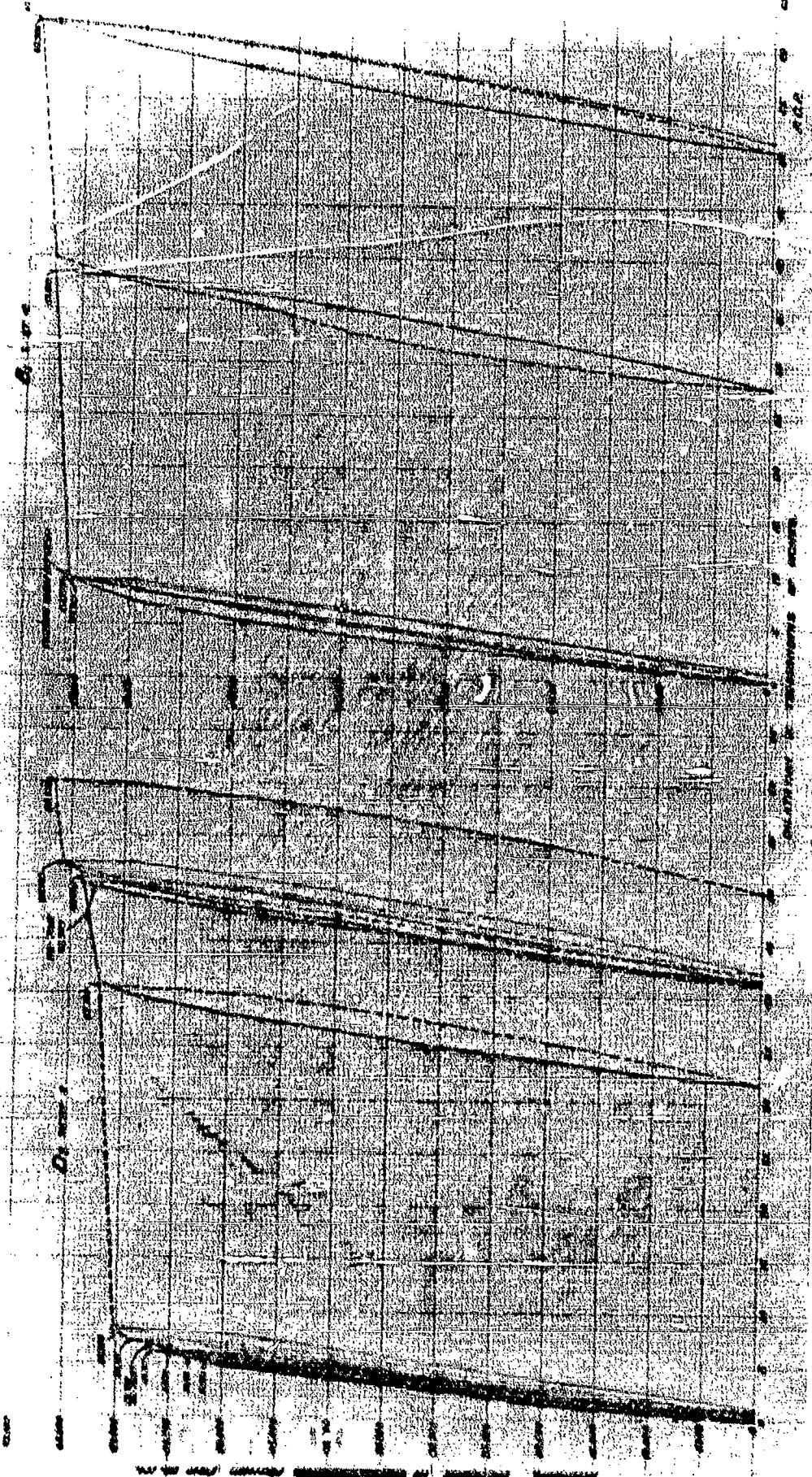
(50)

SPECIFIC FREQUENCY
- 15 MILLION CYCLES

874.630-6741

14

SUCCESSIONAL
THREE-DIMENSIONAL
POINT CYLINDER
(points as areas)



WTW.639-6703

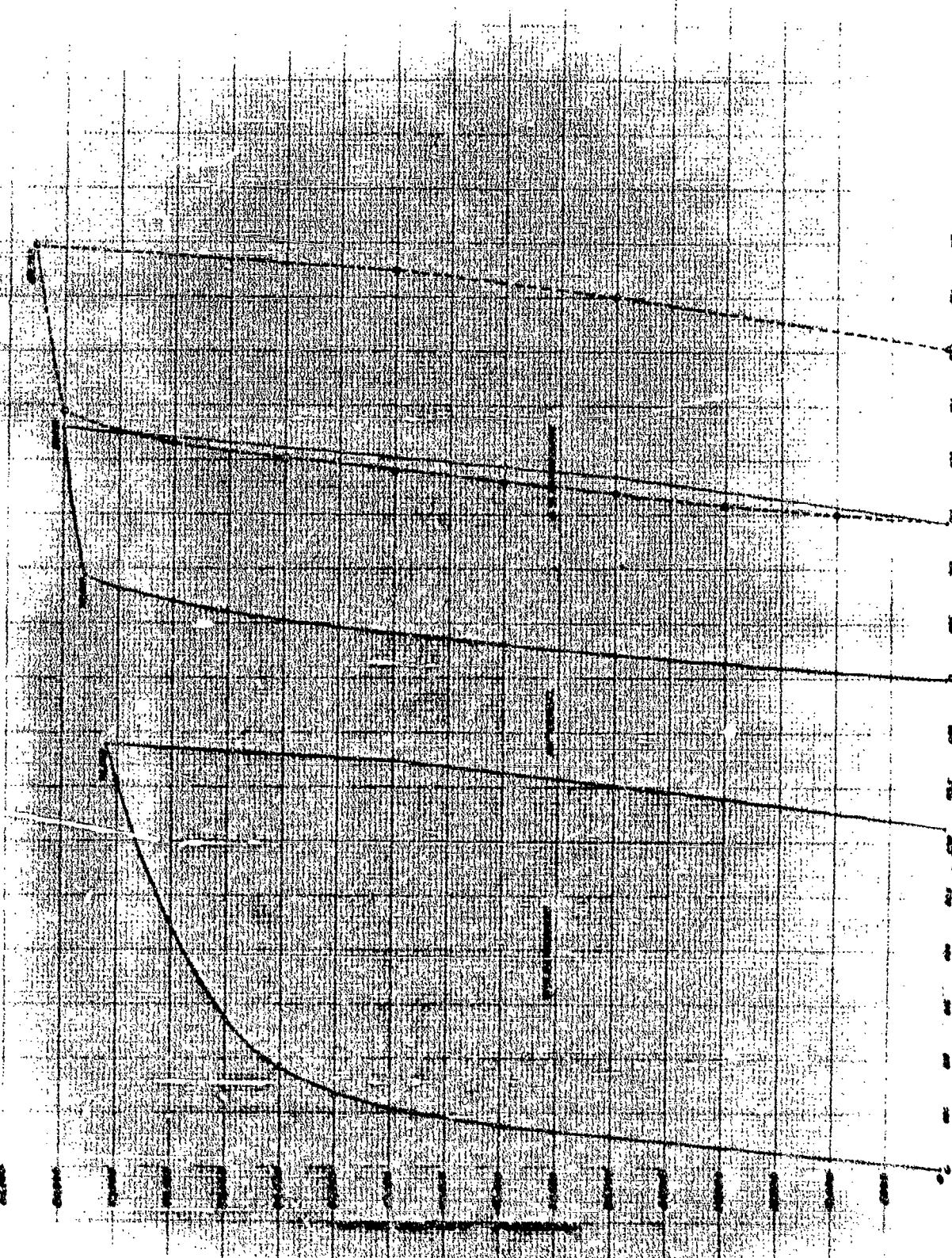
RECEIVED
SIX FEET HOLLOW CHIMNEY
NO. 1007 A

UTN. 639-660

(8)

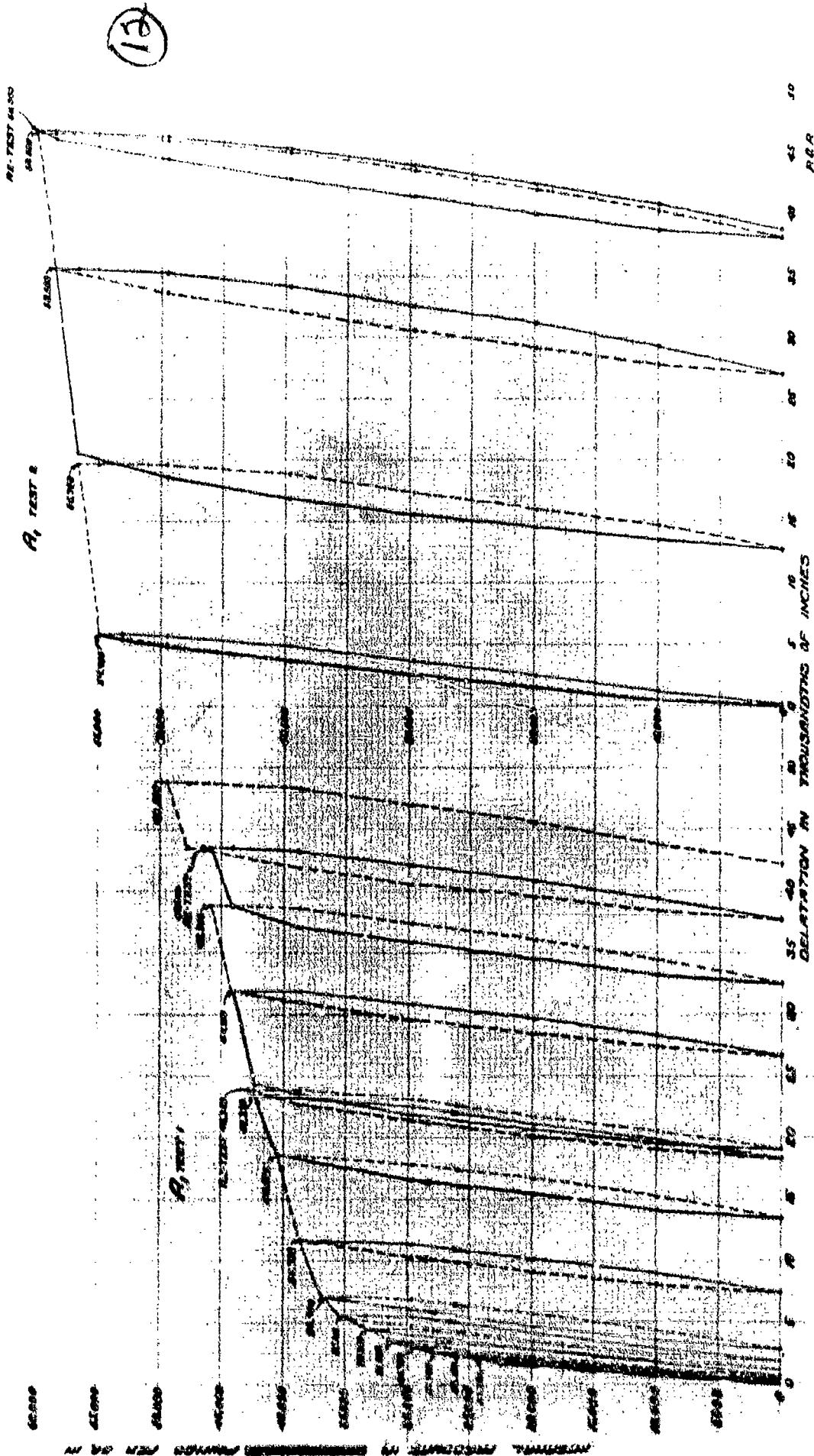
INTERMEDIATE TREATMENT PROGRAM

CYLINDER 3

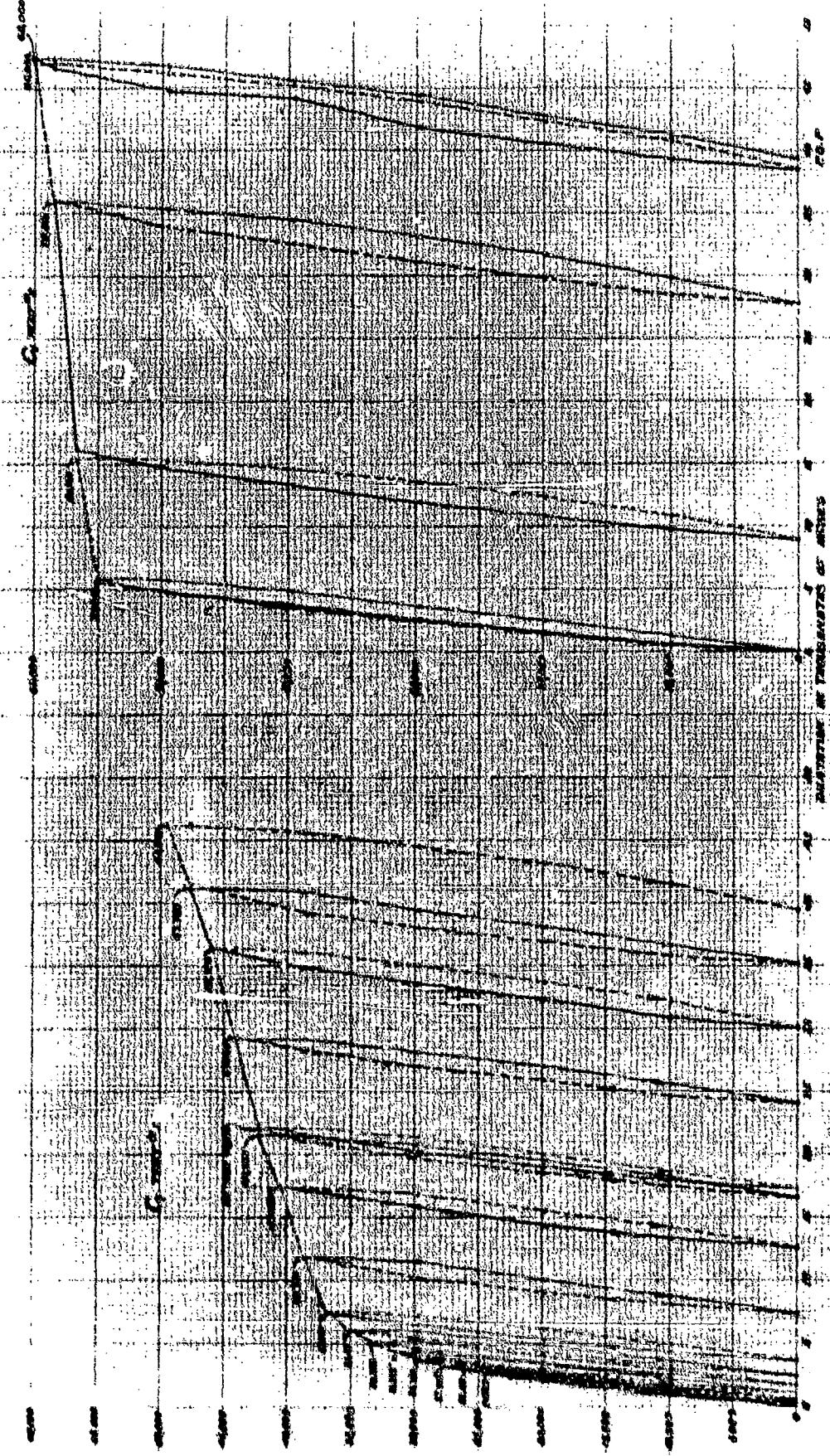


840-639-6771

CHAMBER TEST 1 in.²
SUCCESSIVE DILATATION
3 x 7.5 HOLLOW CYLINDER
AT POINT A₁ TEST 1 AND A₂ TEST 2
(as recorded on DR. 2020-2037)



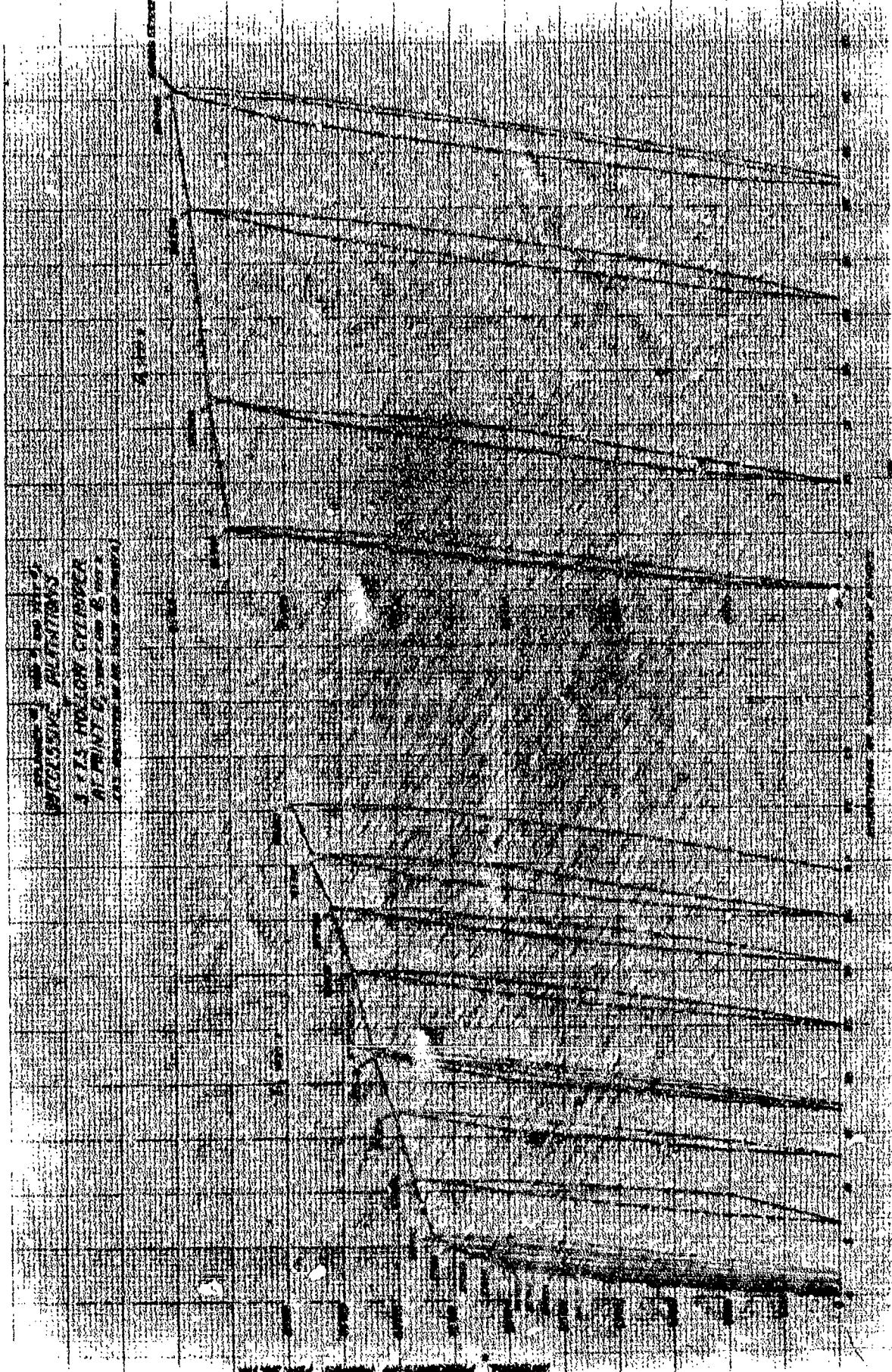
57
Cylinders TEST 7¹/₂
SUCCESSIVE DILATATIONS
4 x 35-MM-1000 SPACER
ATTACHMENT C
TRANSMITTER IN SIGHT - NOISE



TEST 7 1/2 0 20 40 60 80 100

WTN.639-6743

40



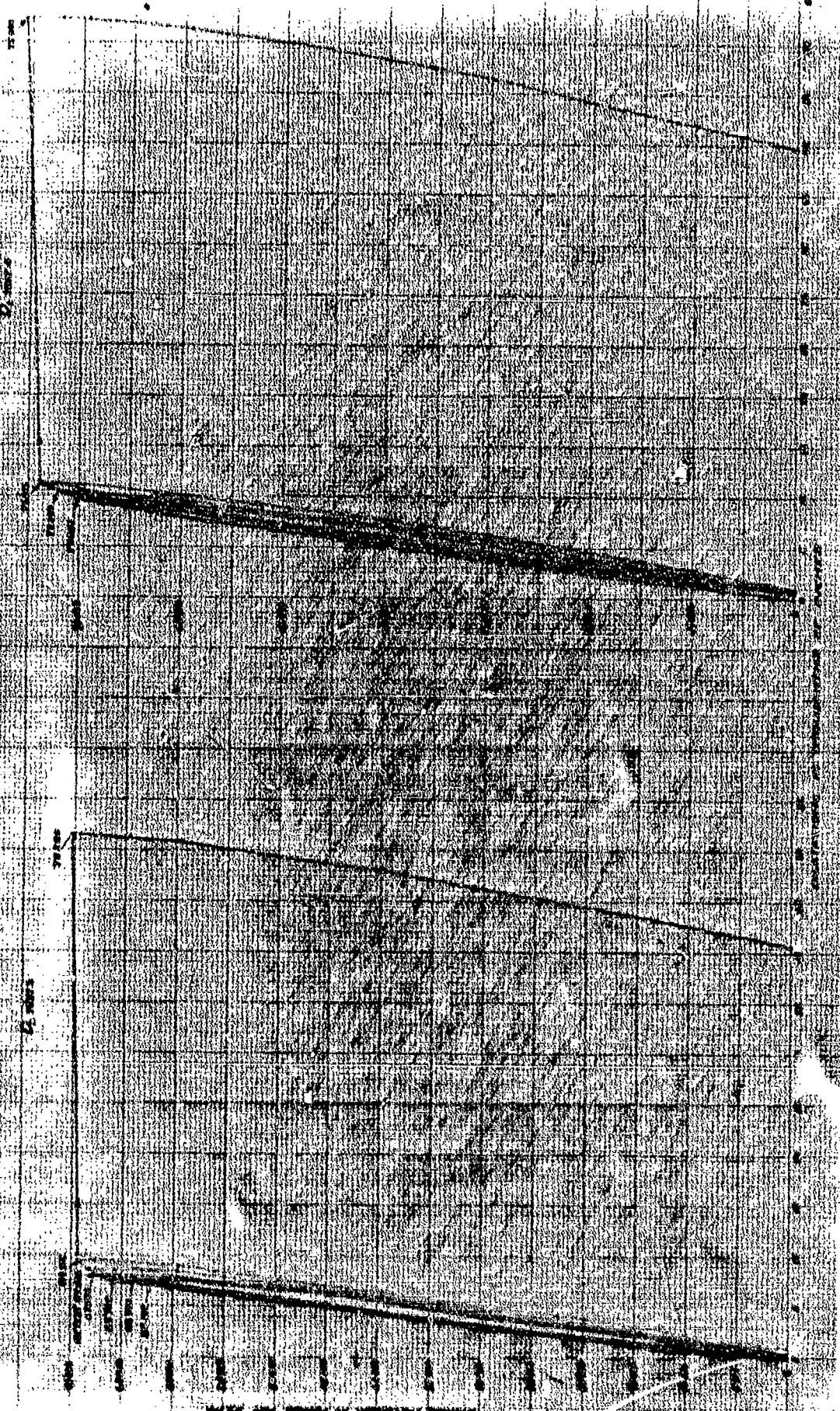
WTH.63D-6729

(1)

CYLINDER 2 INCHES
SUCCESSIONAL
3 X 7.5 HOLLOW CYLINDER
AT POINT ONE 7/8
Cylinders
Cylinders

UTN.639-6683

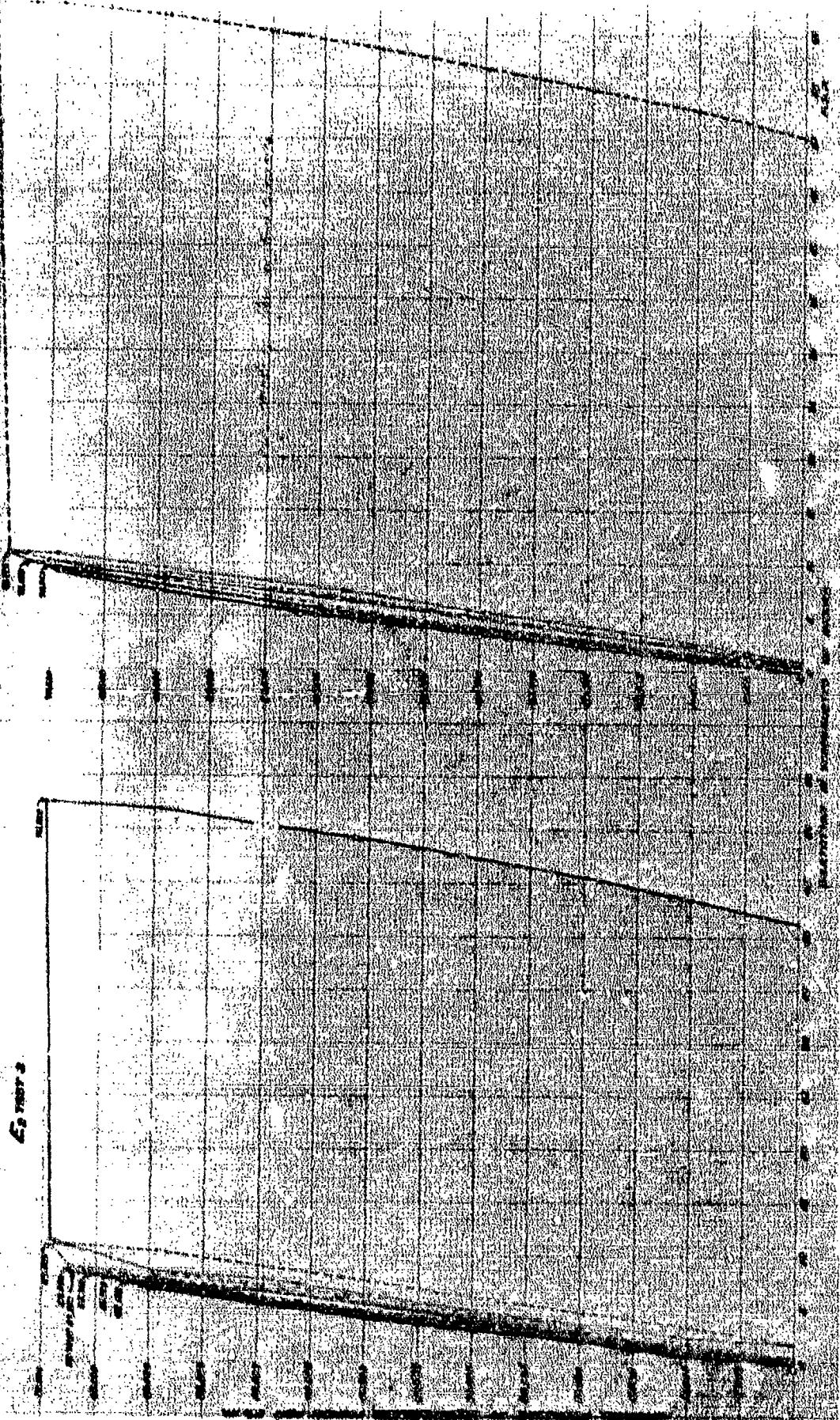
WTM. 630-6684



SUCCESSIVE PLATEATION
3.45 HOLLOW CYLINDER

(3)

CHURCHILL, JOHN
SUCCESSIVE EJECTION
BY 25 HOLLOW CHAVER
AT POINT CROWN CROWN
IN SEVEN OR EIGHT ANGLES



W.M.630-6702

MR. 630-6776

18

INTERVIEWING TECHNIQUE WORKBOOK

11

SEARCHED
INDEXED
SERIALIZED
FILED
APR 22 1968
FBI - NEW YORK

678-639-6700

CONFIDENTIAL INFORMATION

1-75 HOLLOW TREE

1-75 HOLLOW TREE

WPA-639-6738

CHAMPS
PROGRESSIVE
SUCCESSIVE DILATATION
3.775 HOLLOW CYLINDER
AT PAST 6 DAY

WTN.639-6692

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W.H.639-6698

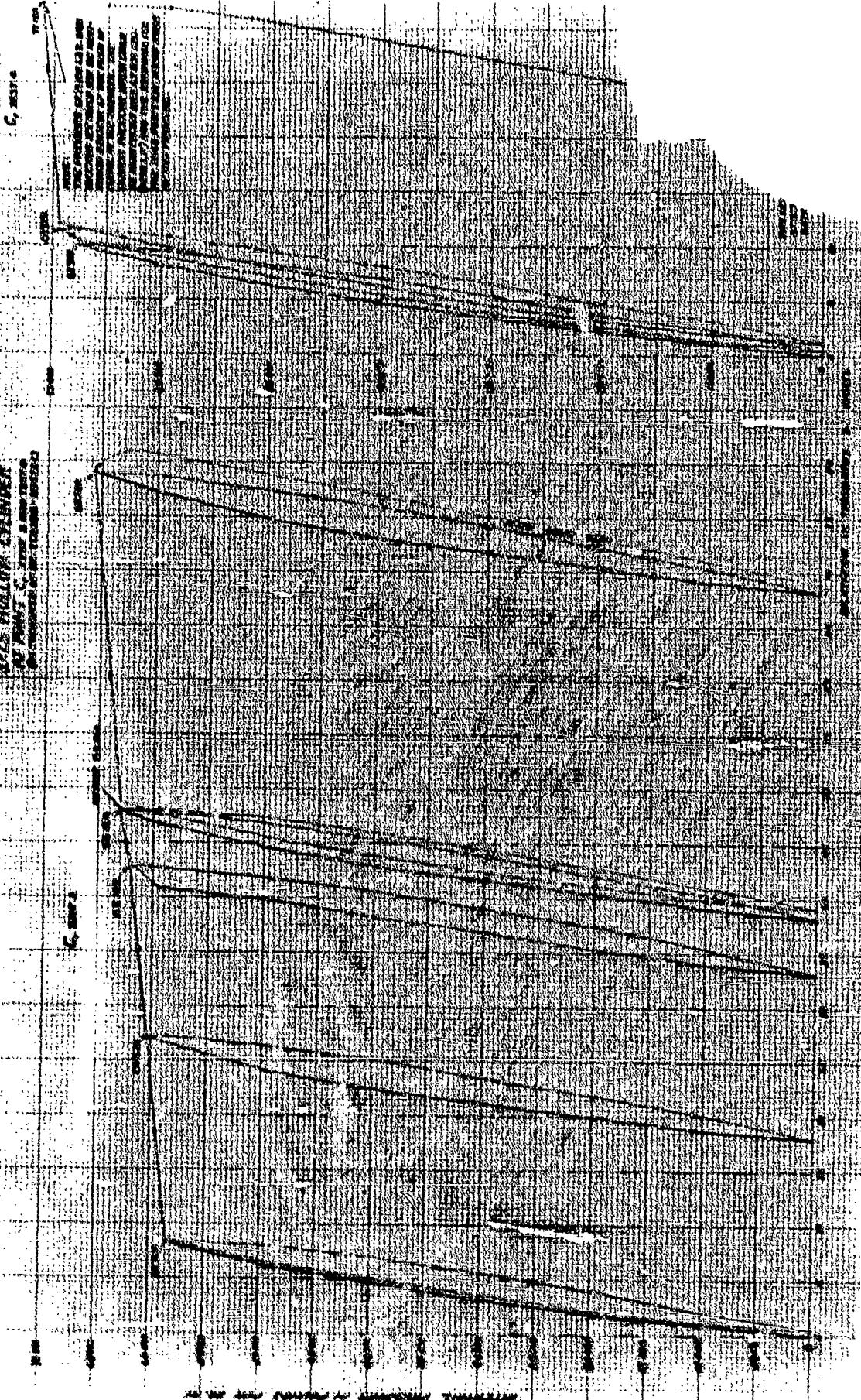
(50)

PROGRESSIVE ENHANCEMENT

1925 HARRY CHURCH

BY RAY COOPER

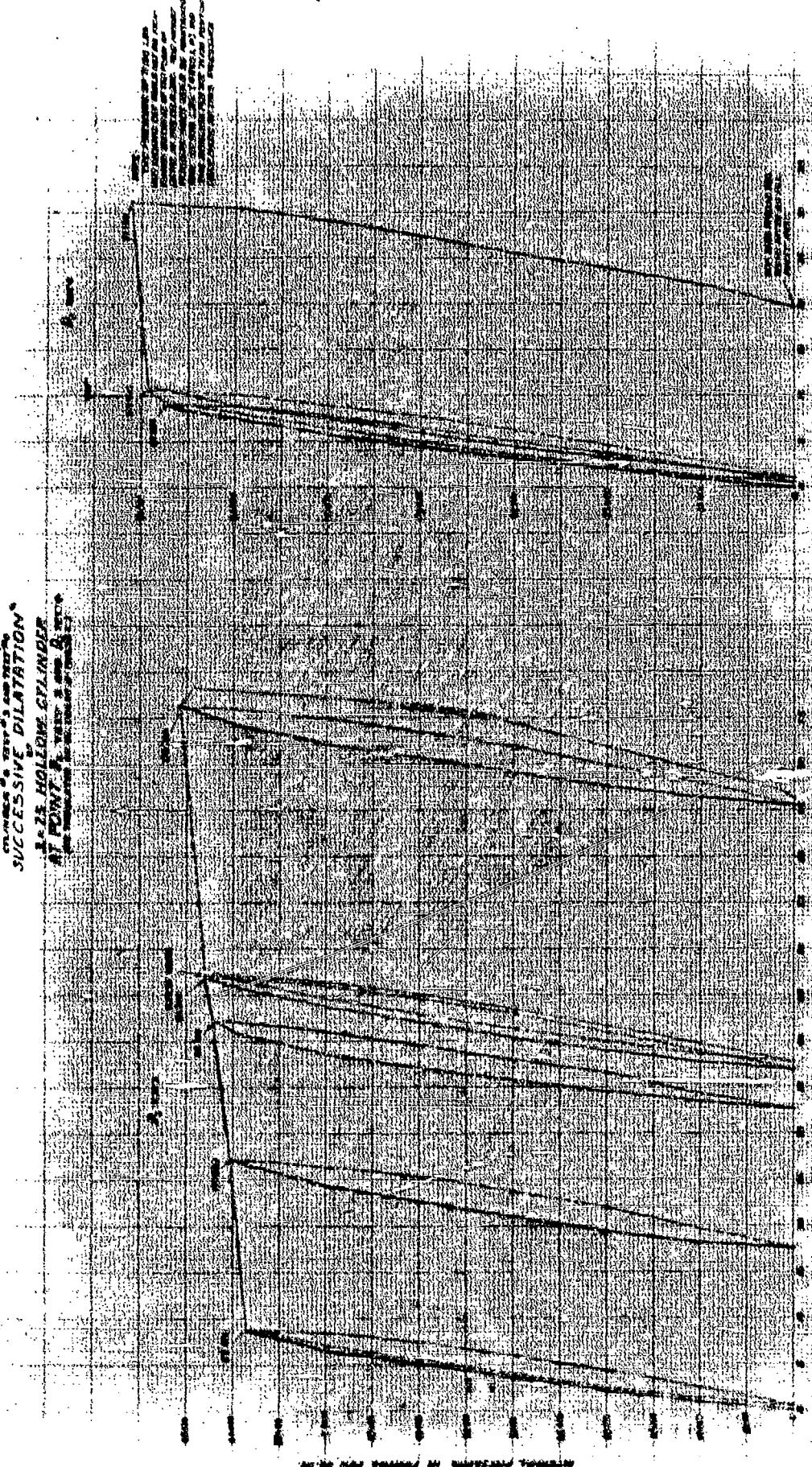
© 1925 BY RAY COOPER



WTN.639-6739

16

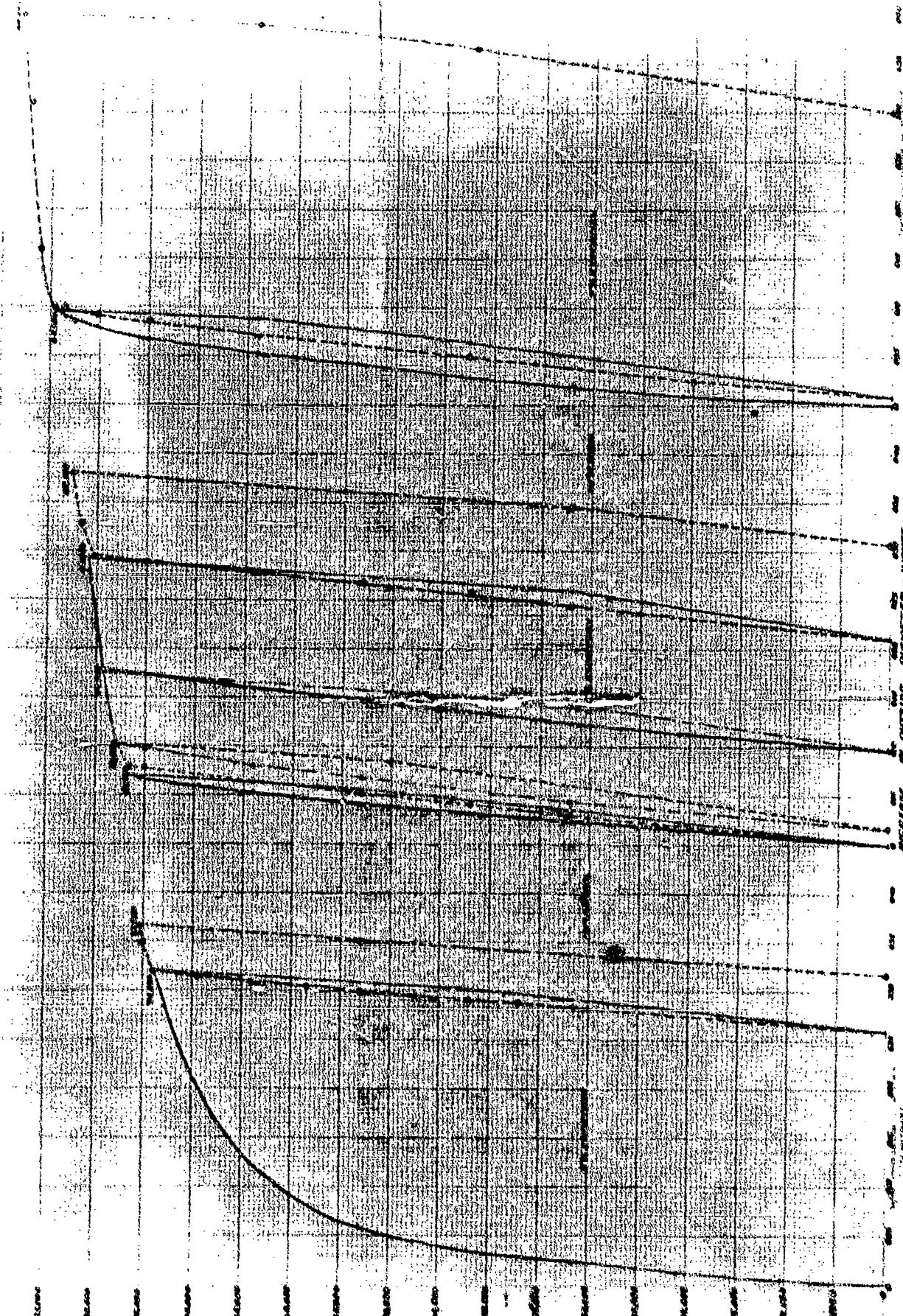
SUCCESIVE DILATATION
BY 15 MM. CYLINDERS
AT POINTS 1, 2, 3, 4, 5, 6, 7, 8



WTN.639-6705

(85)

INTERMEDIATE TREATMENT PROGRAM
CYLINDER 27



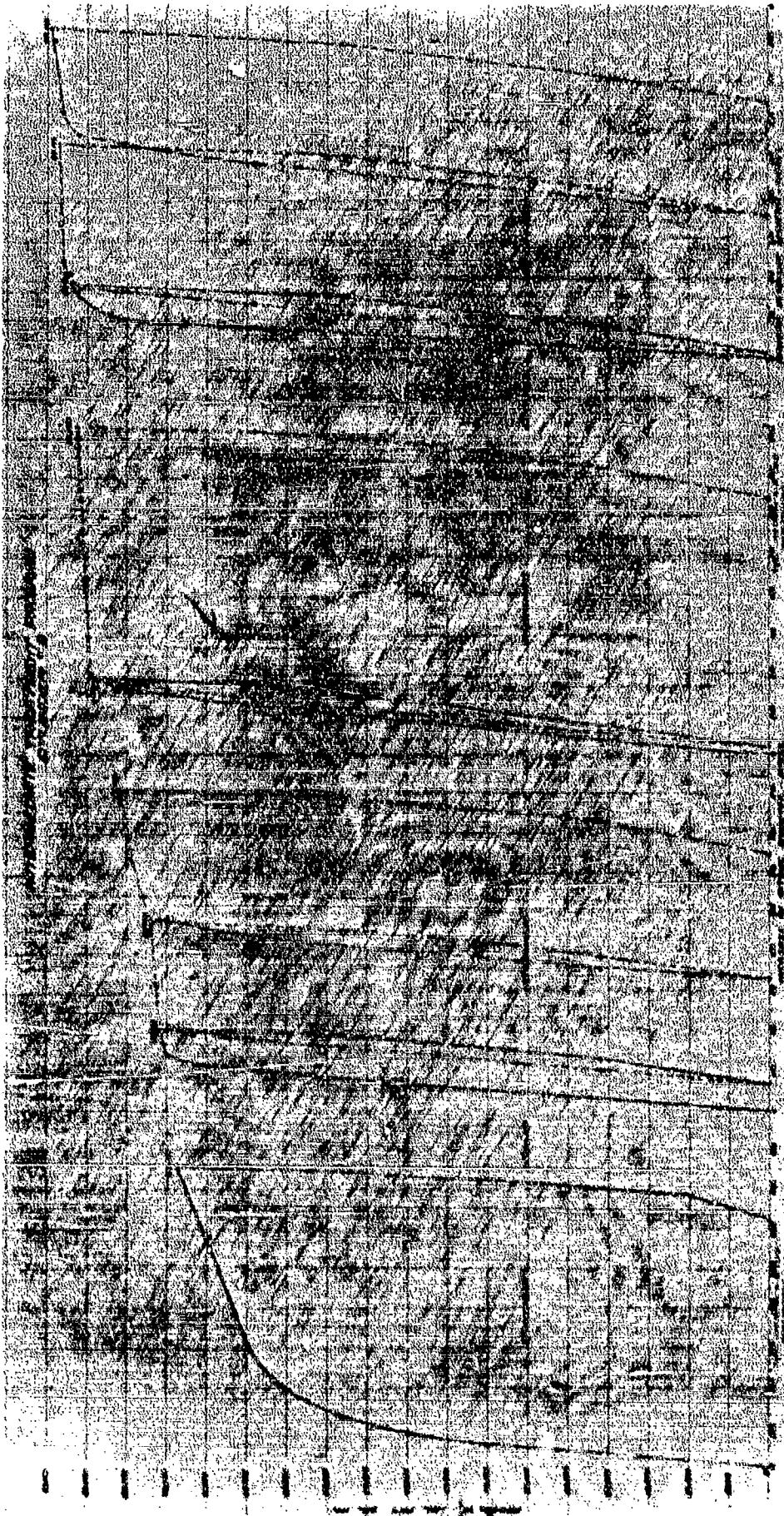
WTN.630-6774

(2)

INTERMEDIATE
MOVING
CHARTS - 2

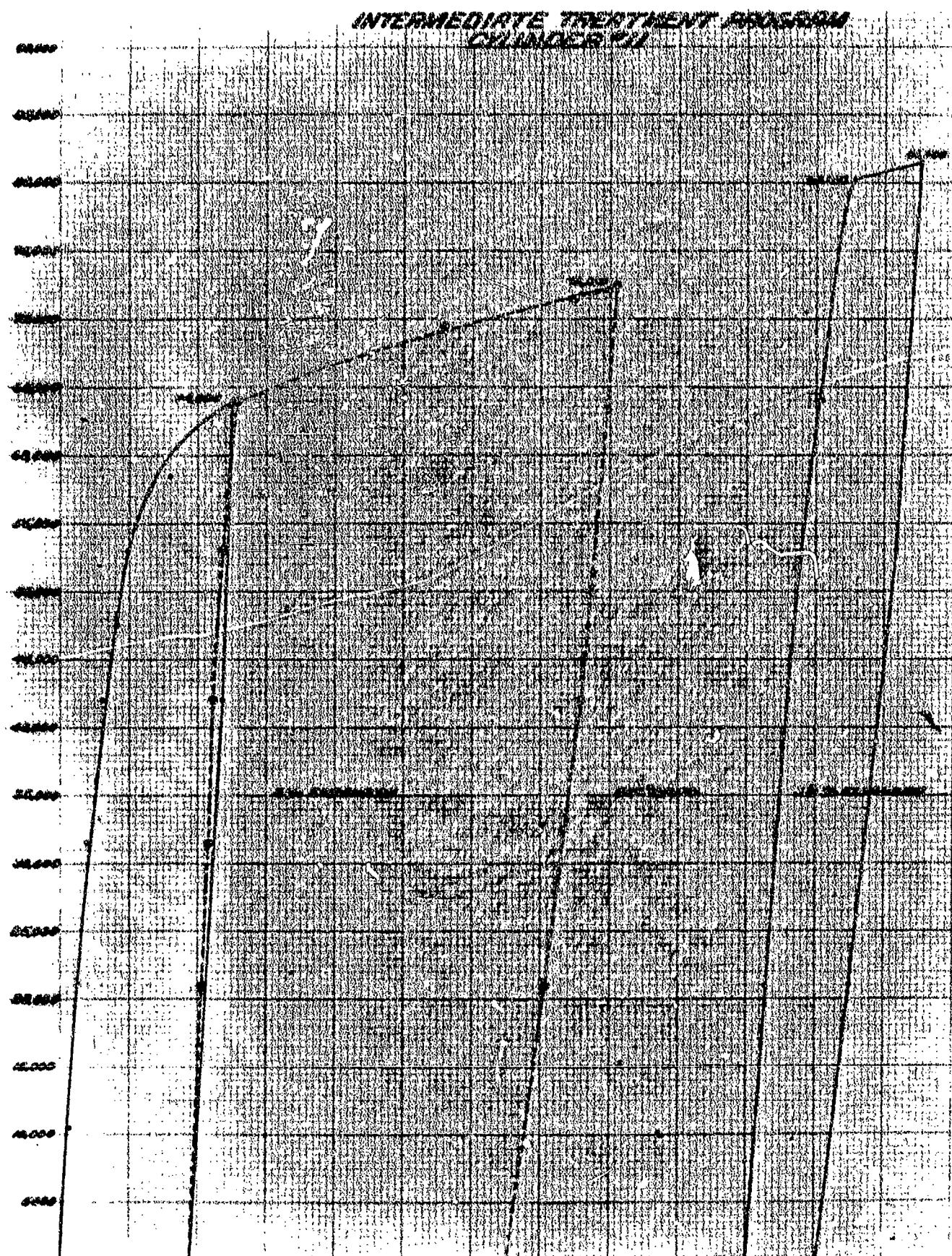
WTN.639-6766

(89)



WTN.639-6778

**INTERMEDIATE TESTIMENT CROSSOVER
CHART NO. 2**



INCREASE IN OUTSIDE DIAMETER - INCHES

WTN.630-672T

(B)

(P)

INTERMEDIATE TREATMENT PLANT
CHARGE REPORT

WTN.630-6767

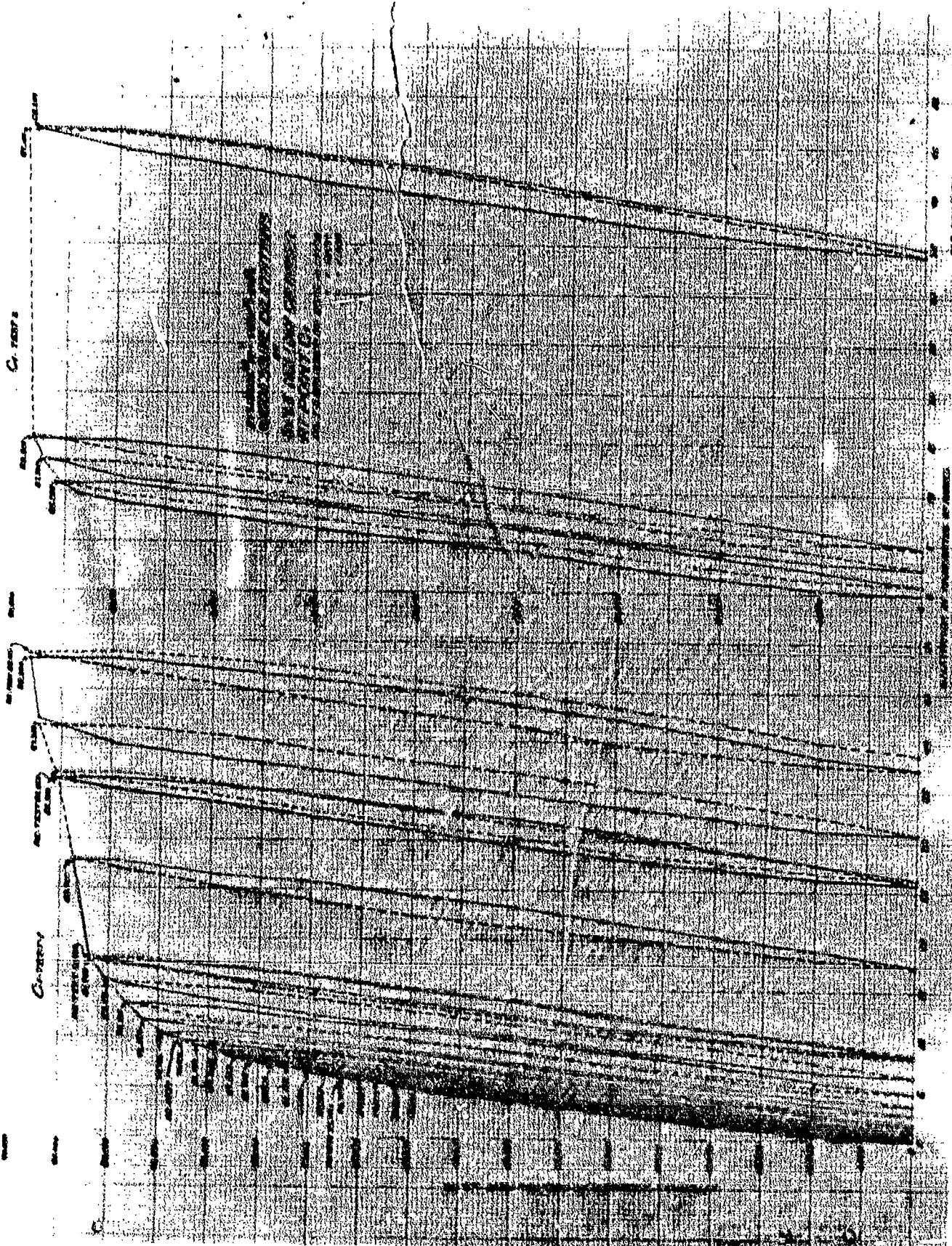
WTN.630-6690

INTERNAL PRESSURE IN POUNDS PER SQ IN

CHART NO. 1
SUGAR BEET
PRESSURE TESTS

(1)

46



INTERMEDIATE TREATMENT PROGRAM
CHANGES

TM.639-6738

6A

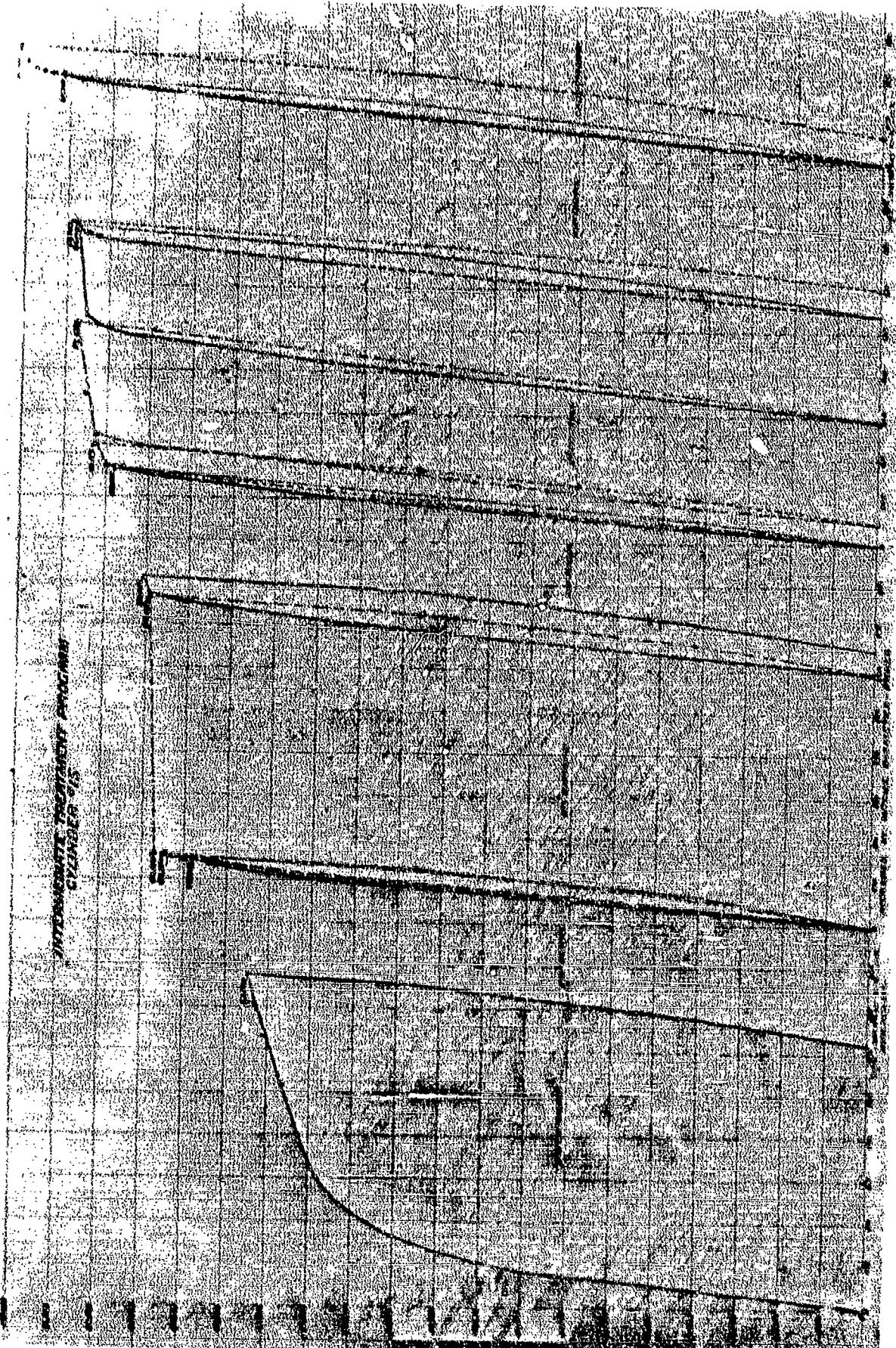
CHANGES IN THE
SUCCESSIVE ORLATIONS
OF THE CHURCH
AT POINT PEAK AND
AT POINT PEAK

WTN.639-6697

CHRONOGRAM
SUCCESSION OF BILATERAL TRANS
3RD HOLLOW CHAMBER
4TH POINT C

WTA.639-6691

(P)

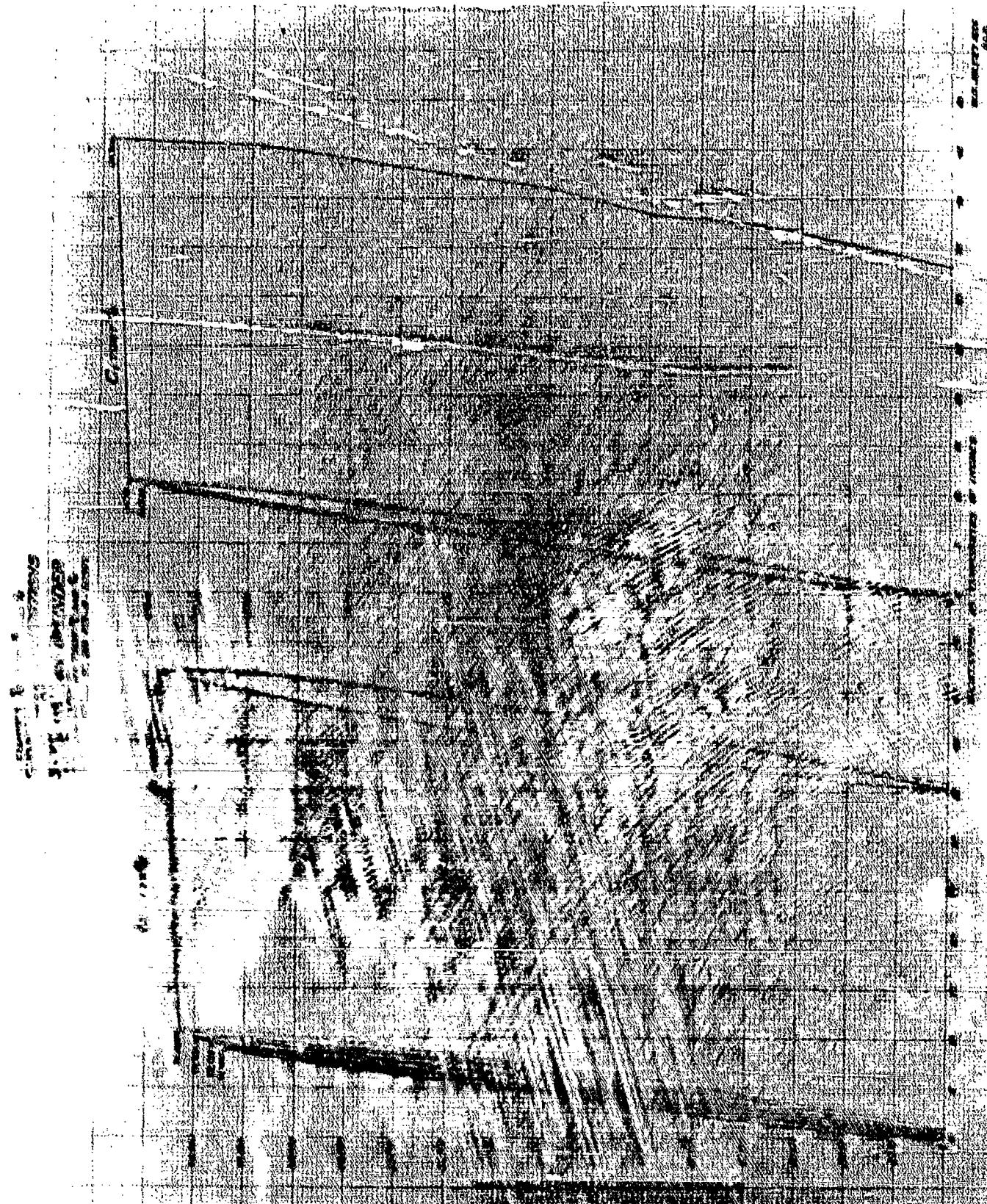


MTM 630-677

CHARTERED MAR 7, 1965
SUCCESSION OF CHANGES
IN PLATE CLOUDS

67N.63D-6695

17



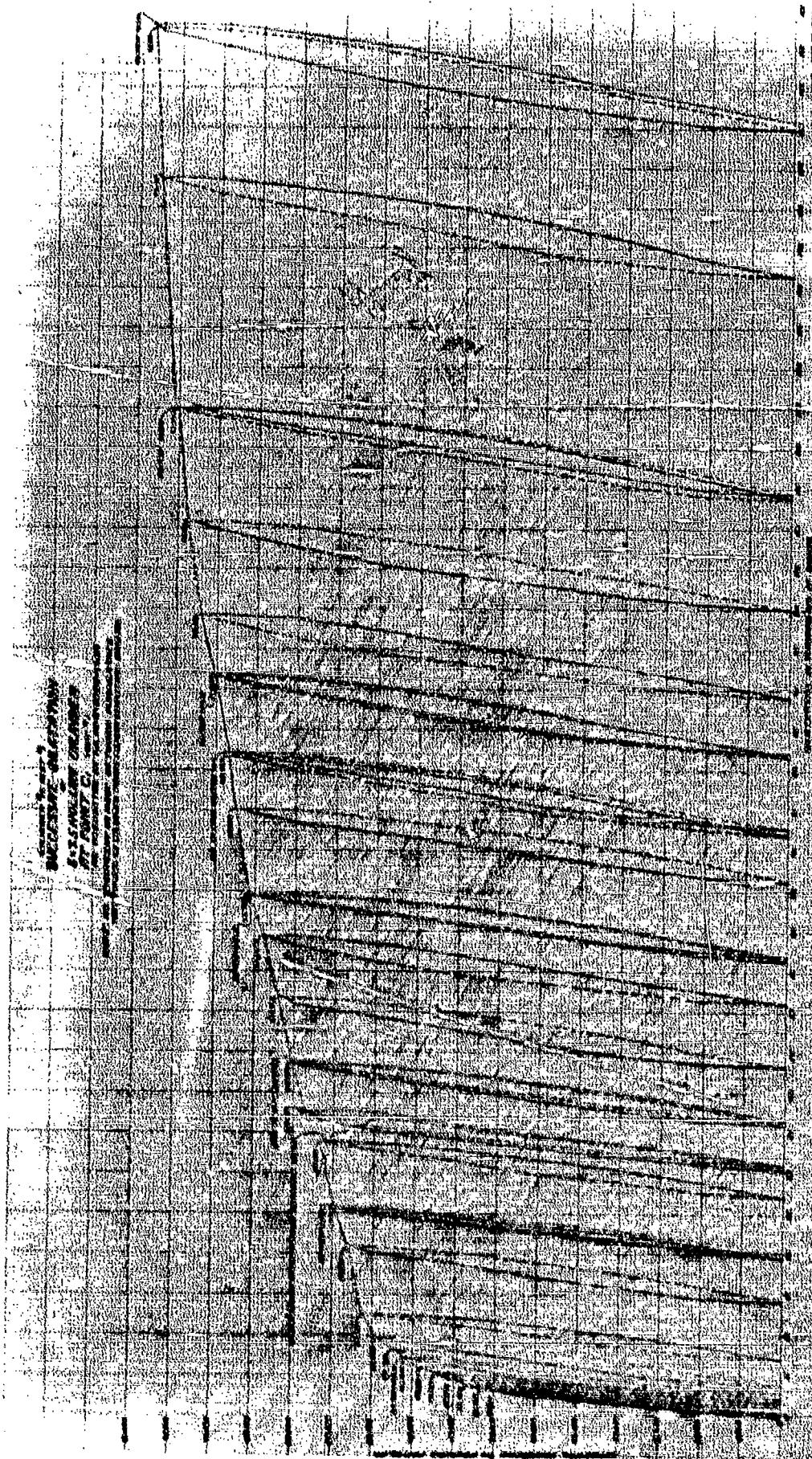
674-639-6695

(82)

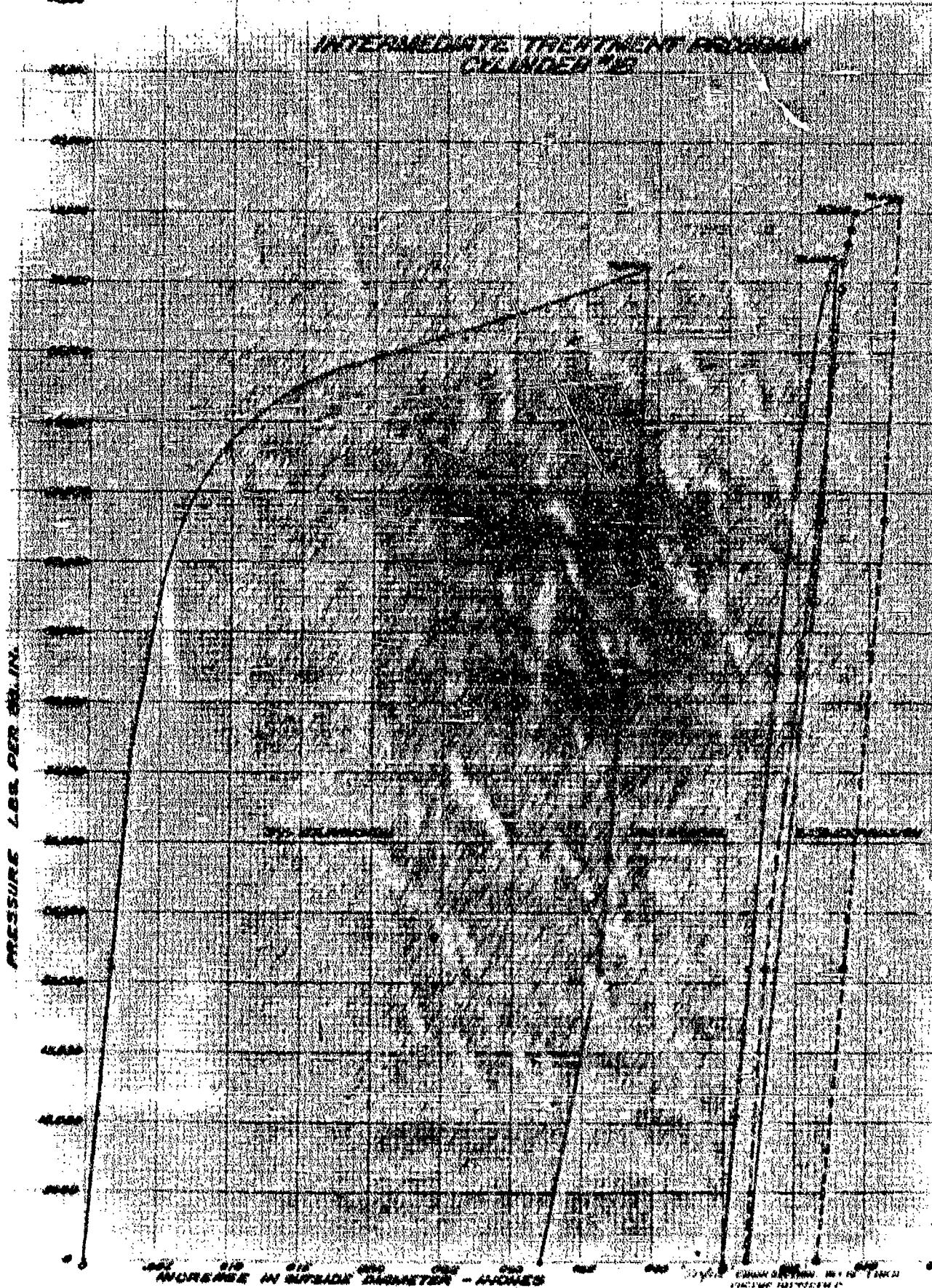


8777

(5)



WTN.633-6740



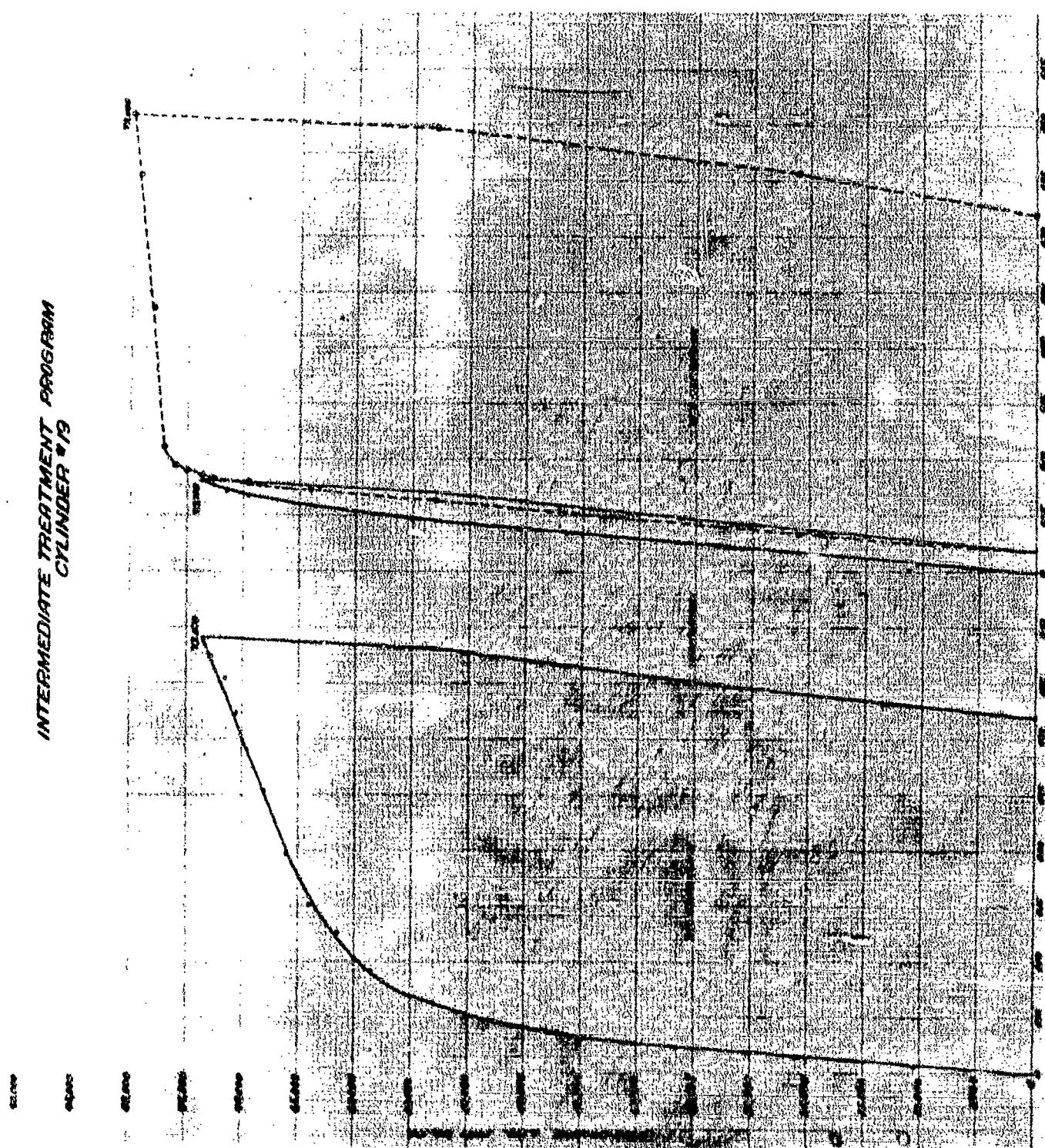
INCREASE IN SURFACE DIAMETER - INCHES

WTN.630-6728

39

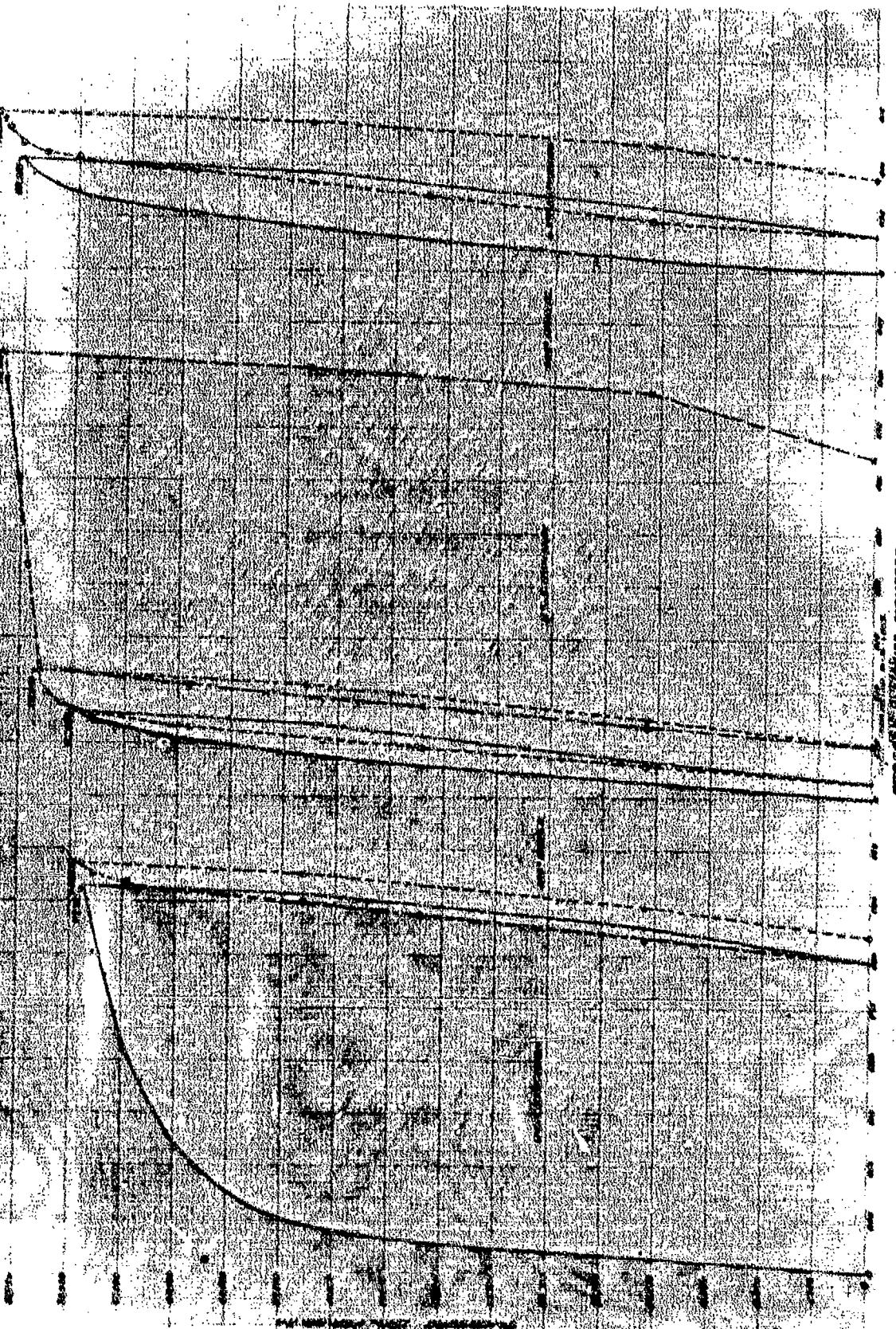
INTERMEDIATE TREATMENT CYLINDER #13

83



Wk.630-6772

INTERMEDIATE TREATMENT PROGRAM
CHAMBER 20

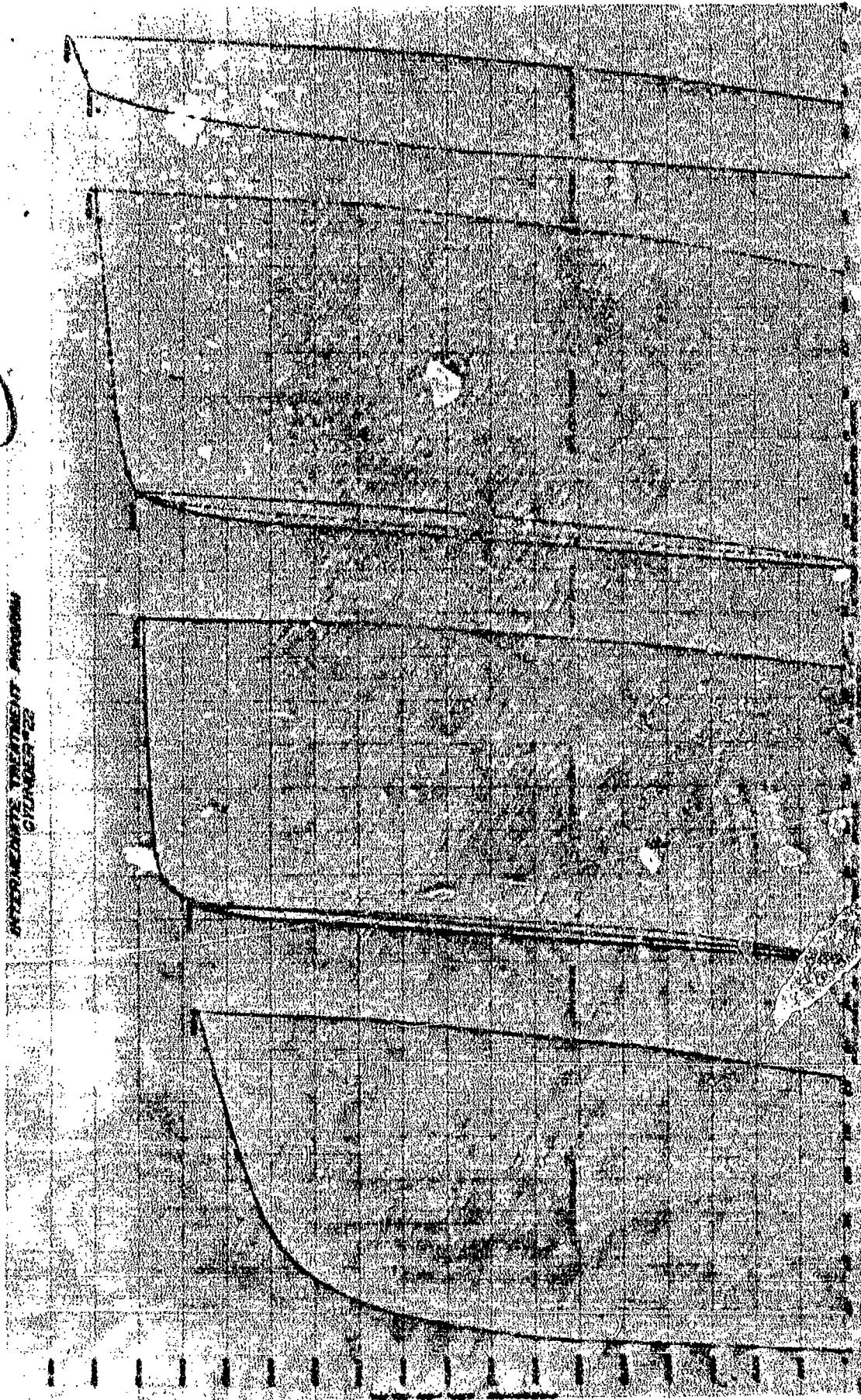


67M.639-6775

INTERMEDIATE TREATMENT PROGRAM
Cylinder #2

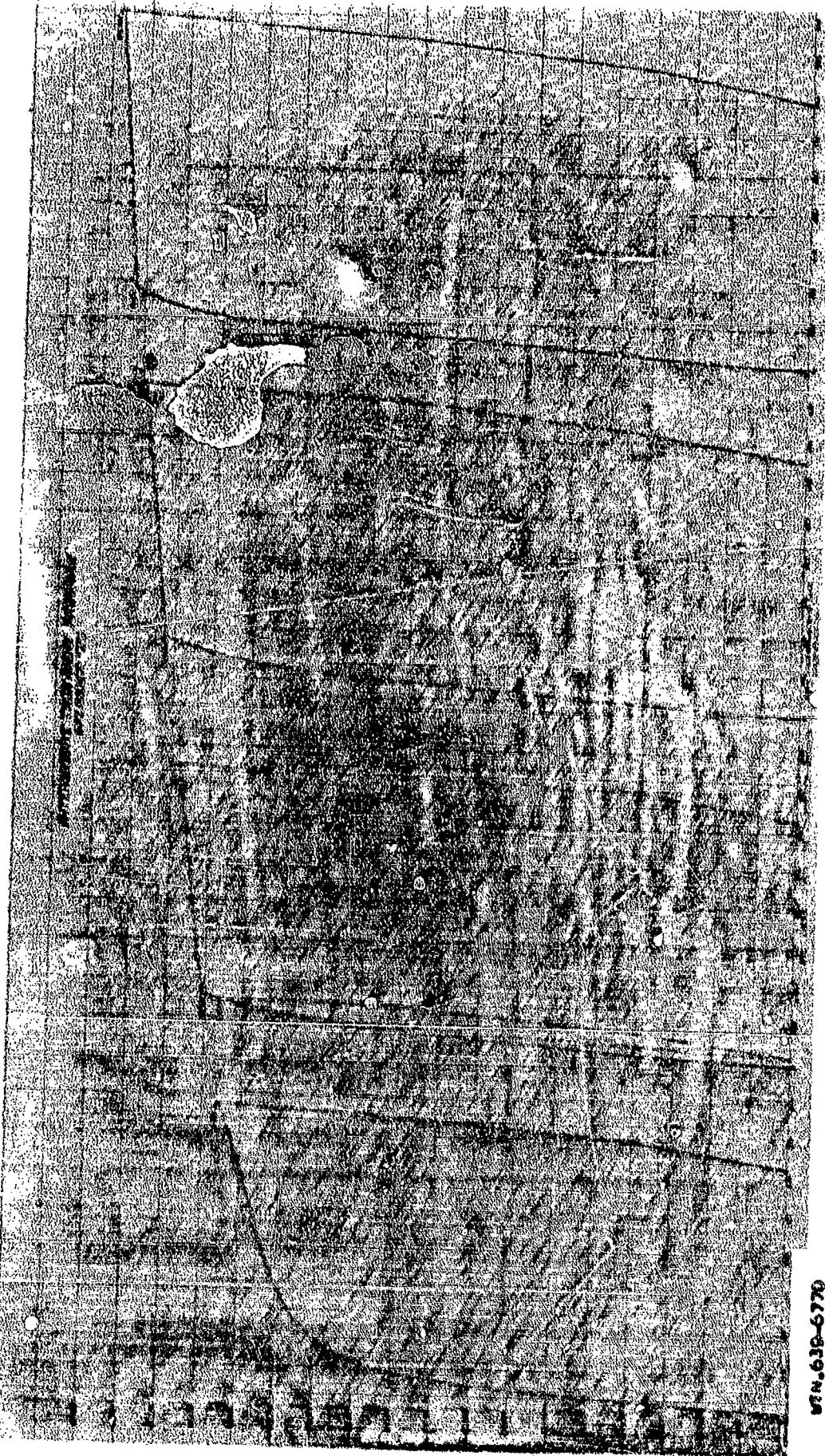
(M)

874-633-6768



WPA-630-6780

(8)



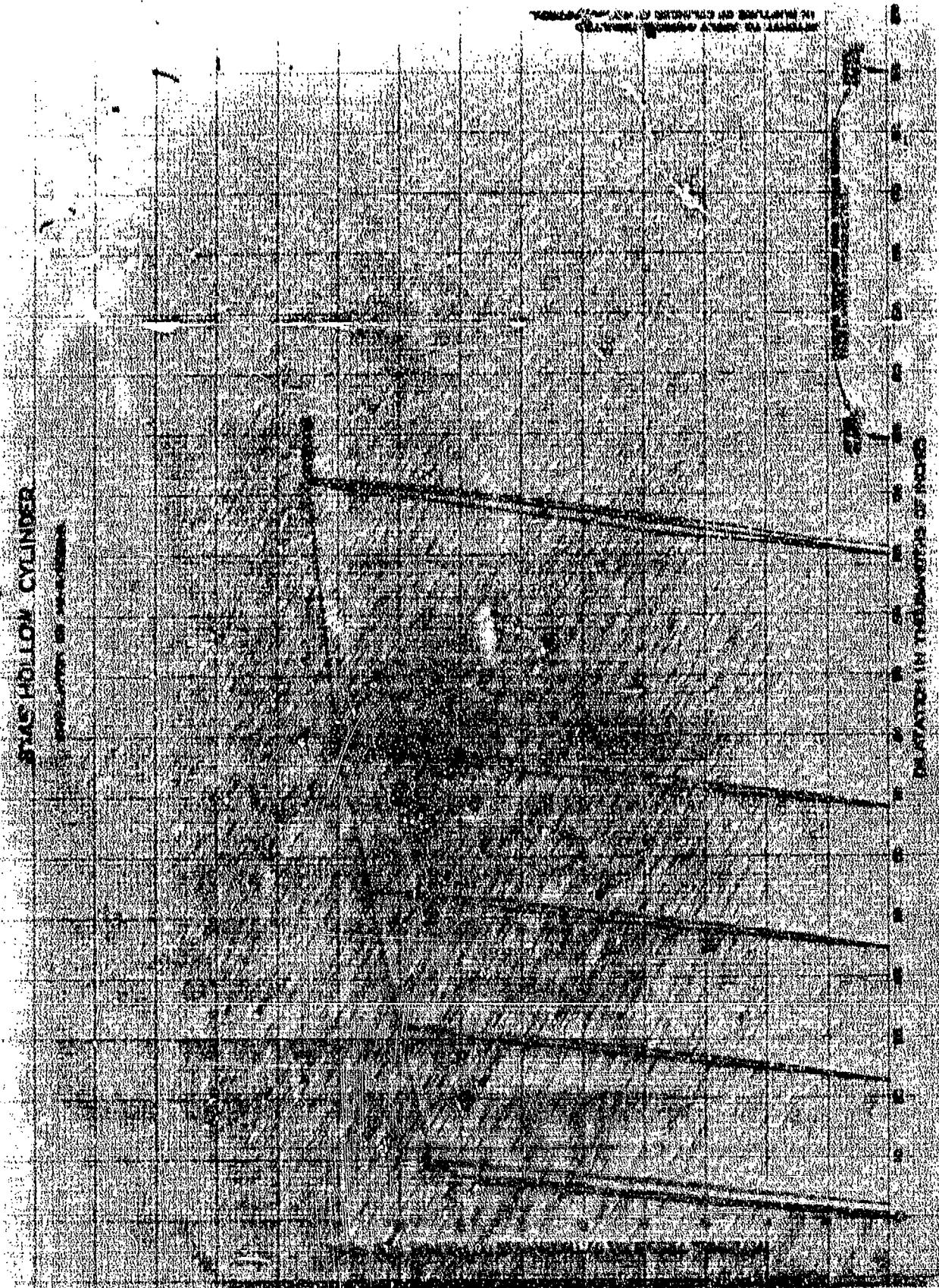
W.H.610-676

67H-632-6715

SUCCESSIONAL DILATATIONS AT POINT C.

STAGE 1610 CYLINDER

1000 μm = 1 mm



RECEIVED DRAFTS & OUT. D.

SECURITY POLICE TWO THREE

WPA-030-0714

24

SUCCESSION OF STATIONS OF HISTORIC

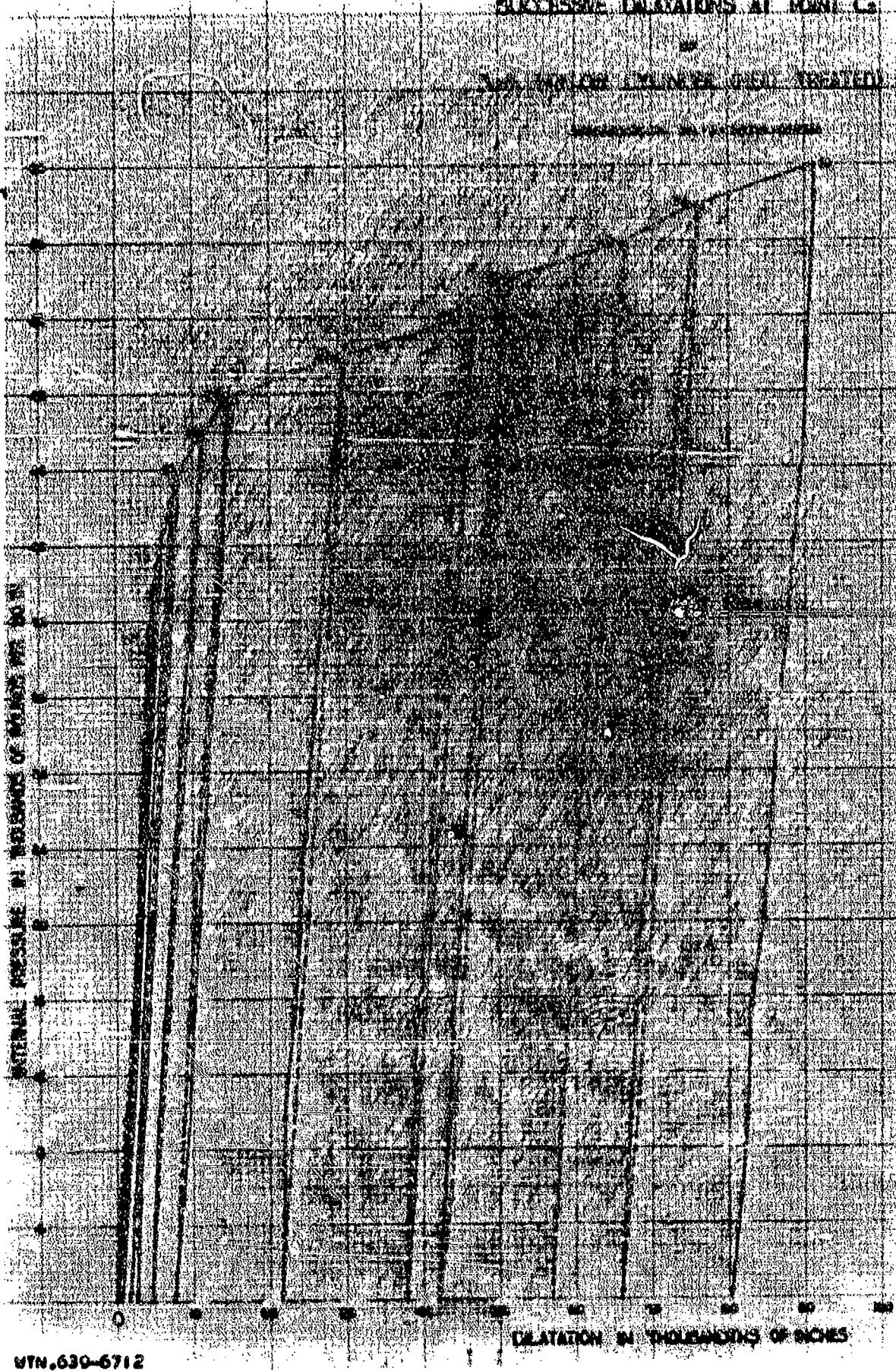
THE BATTLE CAMP

IN THE STATE OF KANSAS

PLATE NO. 1
MAP AND HISTORY OF THE

STATE OF KANSAS

(23) SUCCESSIVE DILATATIONS AT POINT C



WTN.630.6711

5c

WTN.630-6784



WPA.639-6733

(30)

SUCCESSIONAL STAGES AT PNTC

GCY 1200 ft. above Laramie River

1000 ft. above Laramie River

900 ft. above Laramie River

800 ft. above Laramie River

700 ft. above Laramie River

600 ft. above Laramie River

500 ft. above Laramie River

400 ft. above Laramie River

300 ft. above Laramie River

200 ft. above Laramie River

100 ft. above Laramie River

0 ft. above Laramie River

"IN THE SAME POSITION AS CONVENTIONAL HISTORICAL SECTION"

W.M. 639-6710

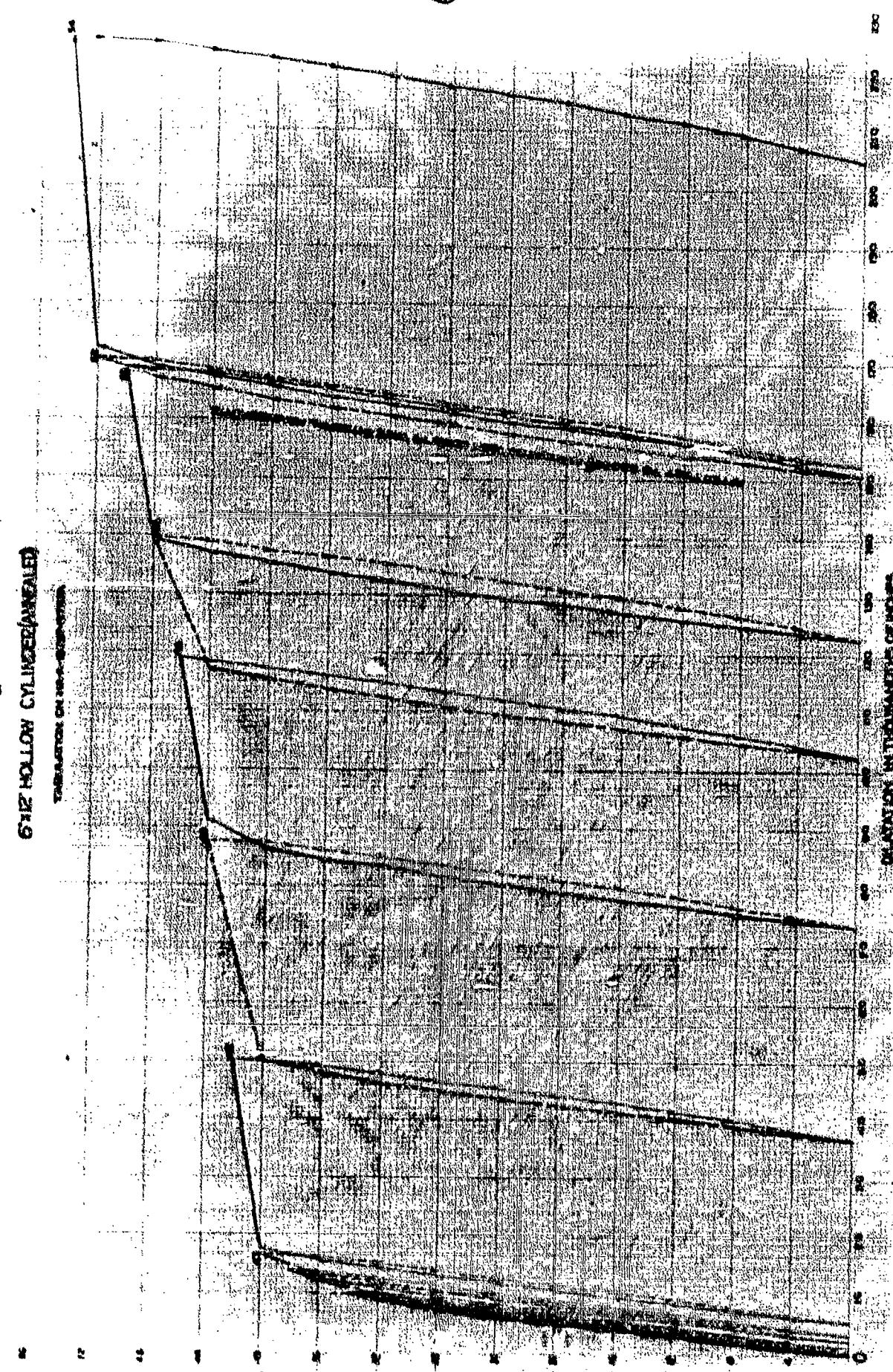
WPA-630-6717

(31)

SUCCESSIONAL DILATATIONS AT POINT C.

6 1/2 HOLLOW CYLINDER MADE

REMARKS ON DRAWING



1400 222 CONSTRUCTION IN INCHES

674-639-6720

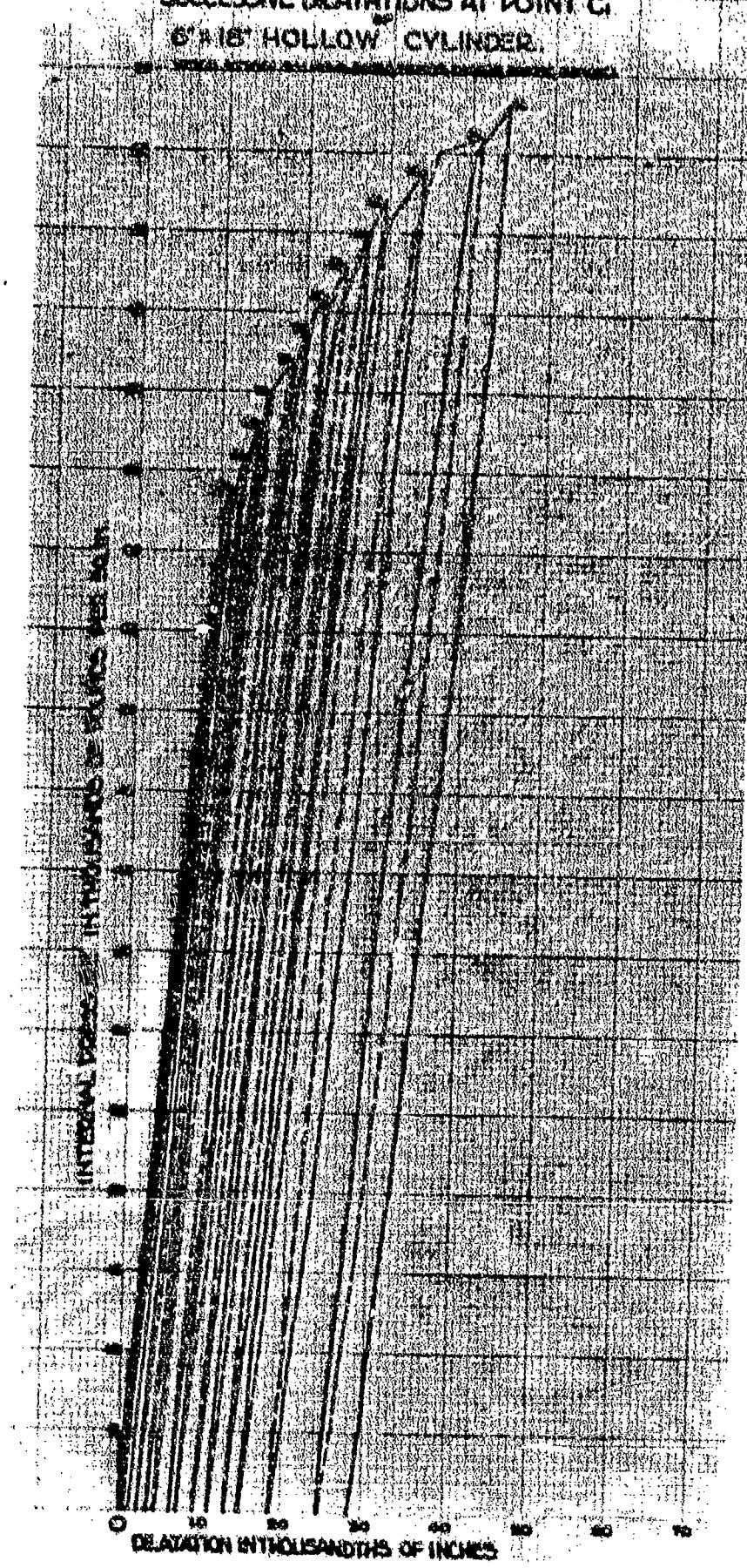
29
Be



WTM.639-6718

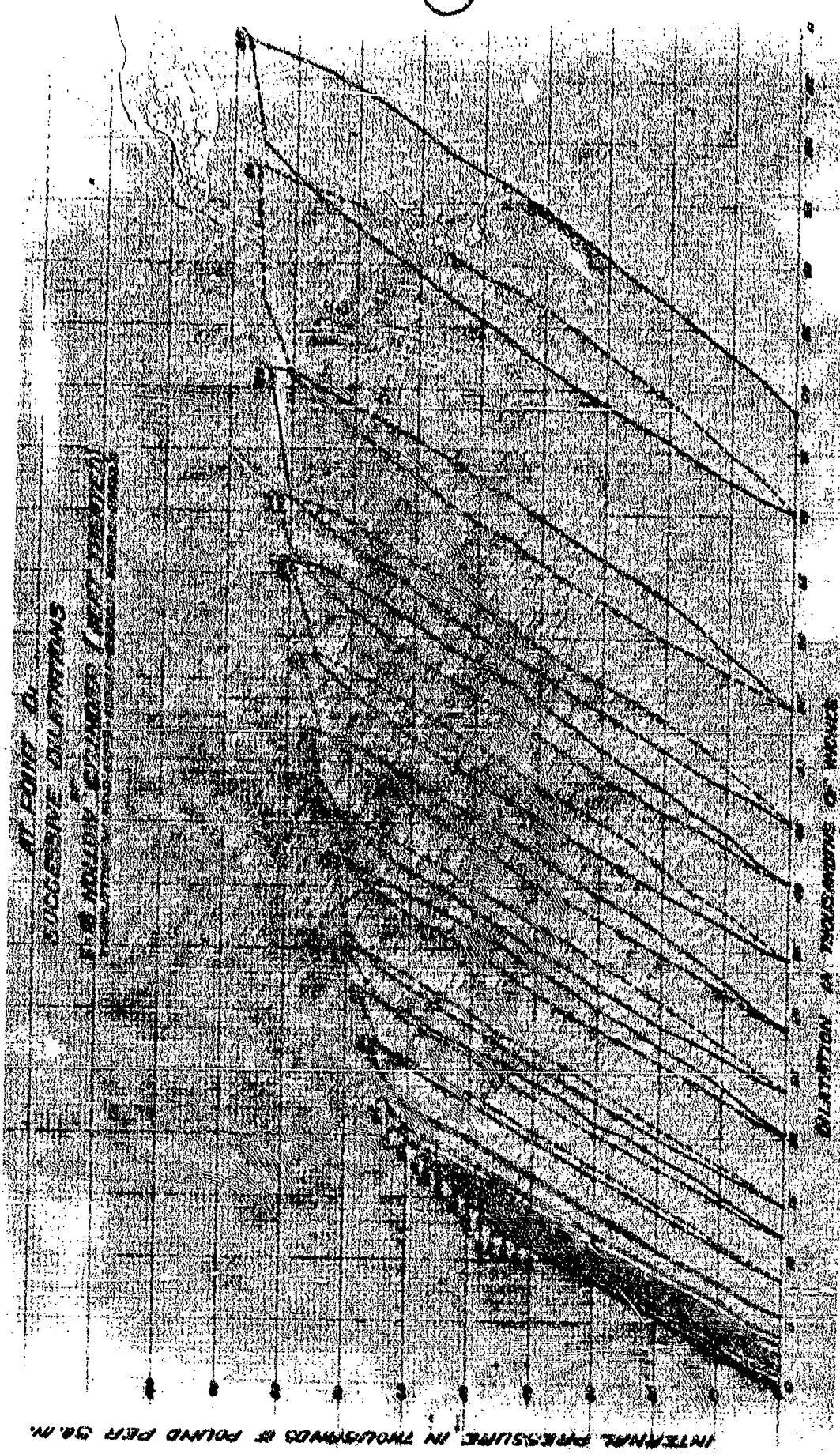
SUCCESSIVE DILATATIONS AT POINT C,
6'-18' HOLLOW CYLINDER.

(62)



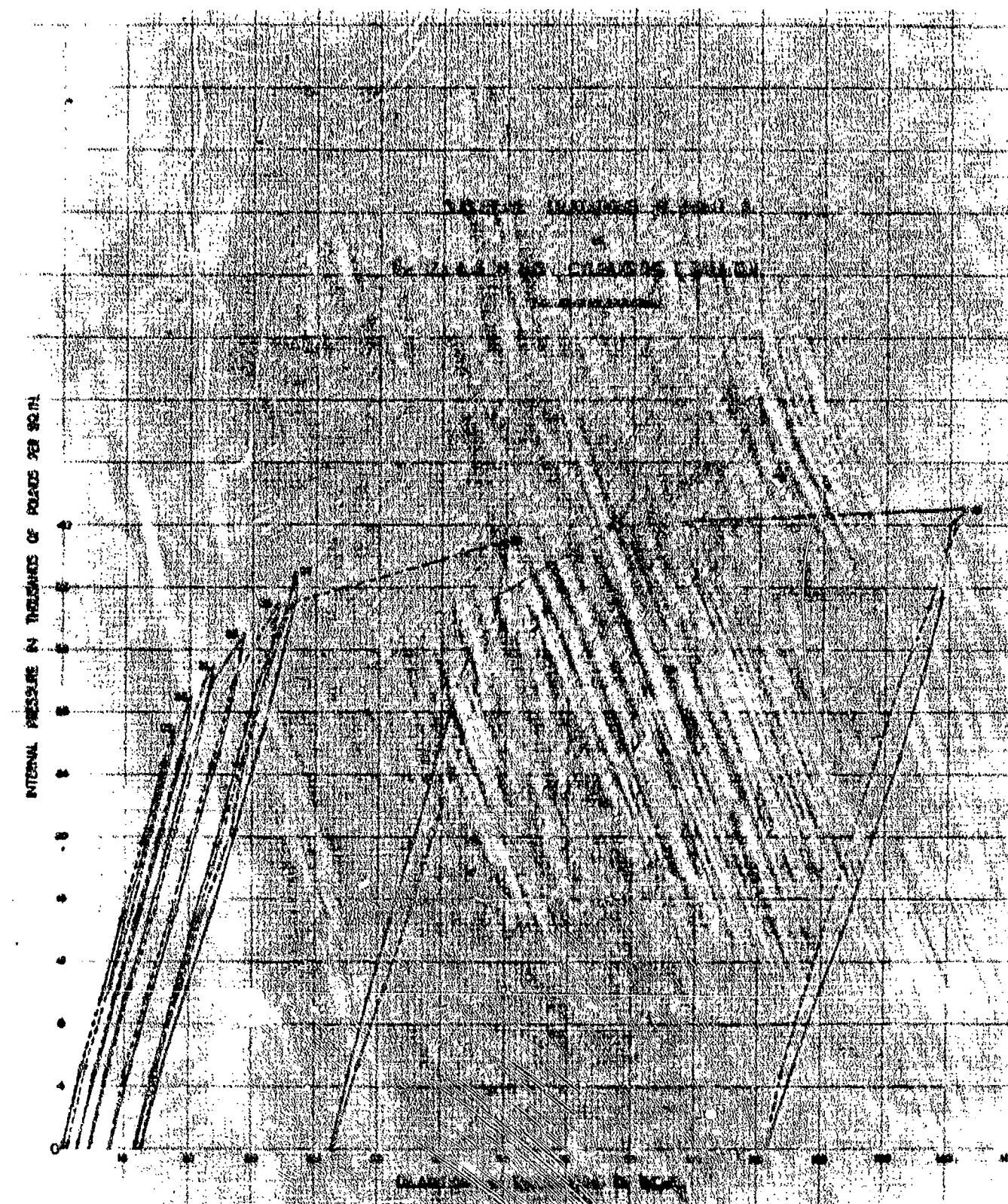
WTN.030-6751

(32)



INTERNAL PRESSURE IN TIRELINES IN POUNDS PER SQ. IN.

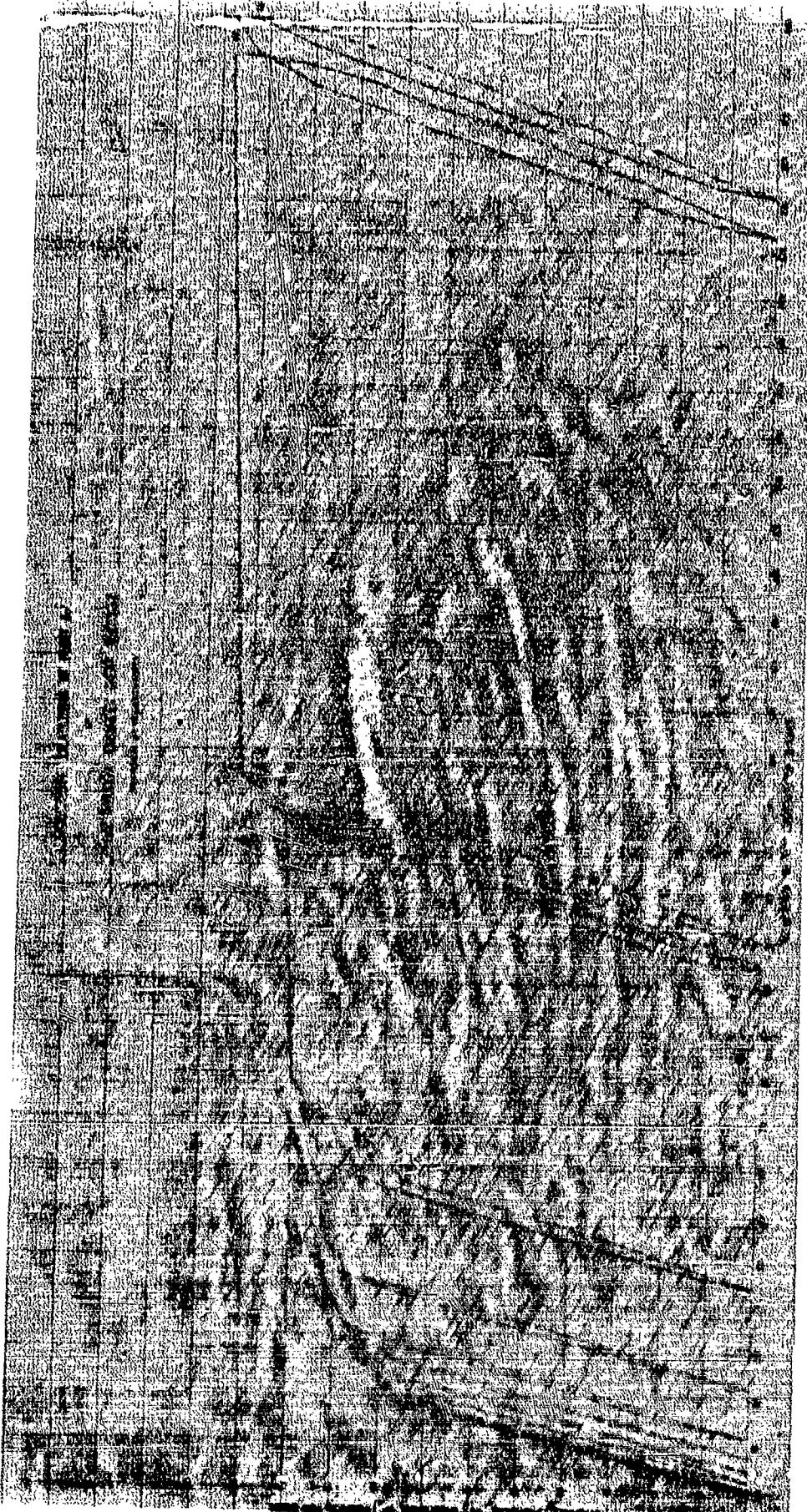
WM.639-6721



WTN.630-6723

341

35



WPA.639.6724

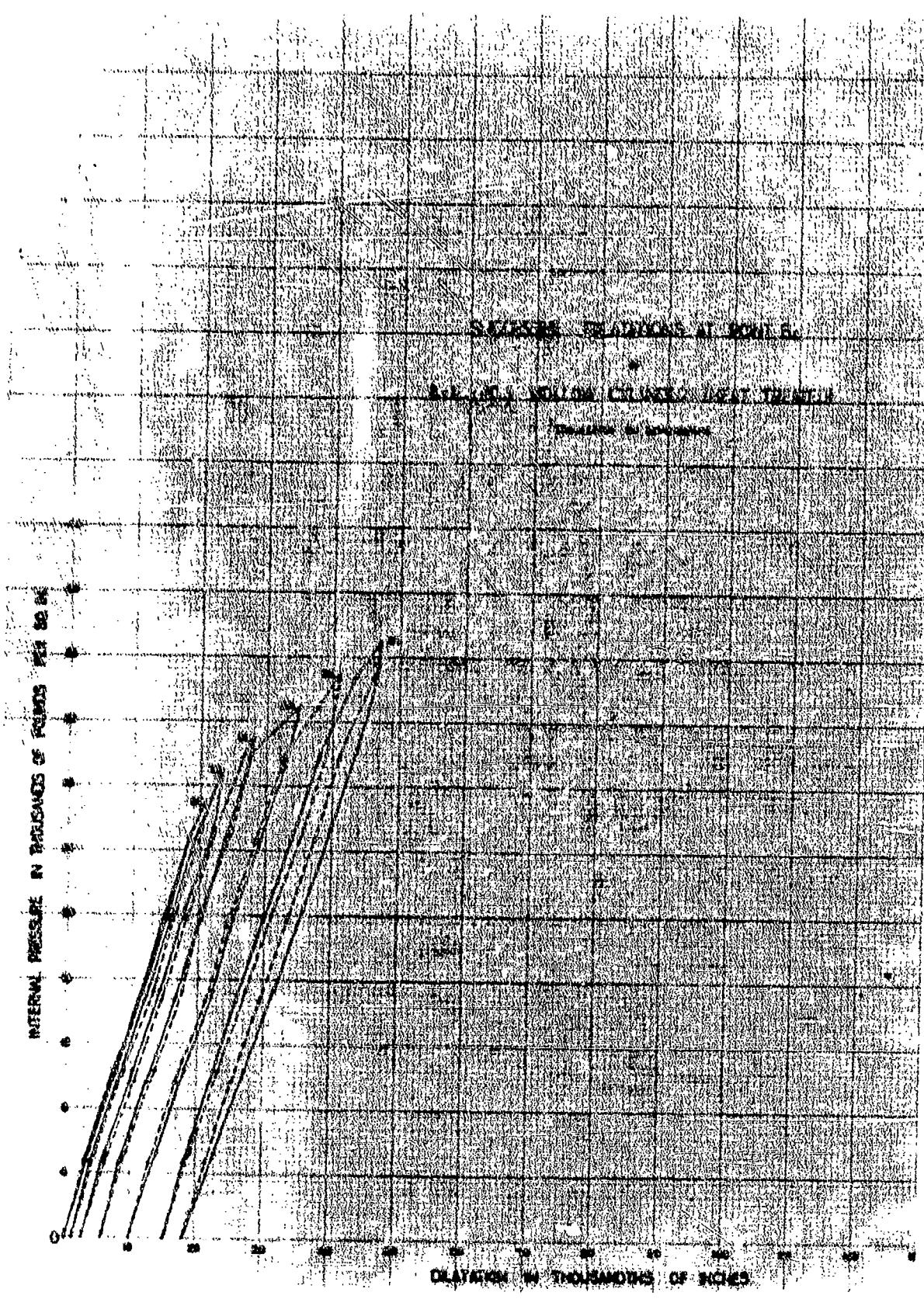
SUCCESSIVE DILATATIONS AT POINT B.

A.D.1405 HOLLOW CHAMFER (HEAT TREATED)

THICKNESS IN MILLIMETERS

(33)

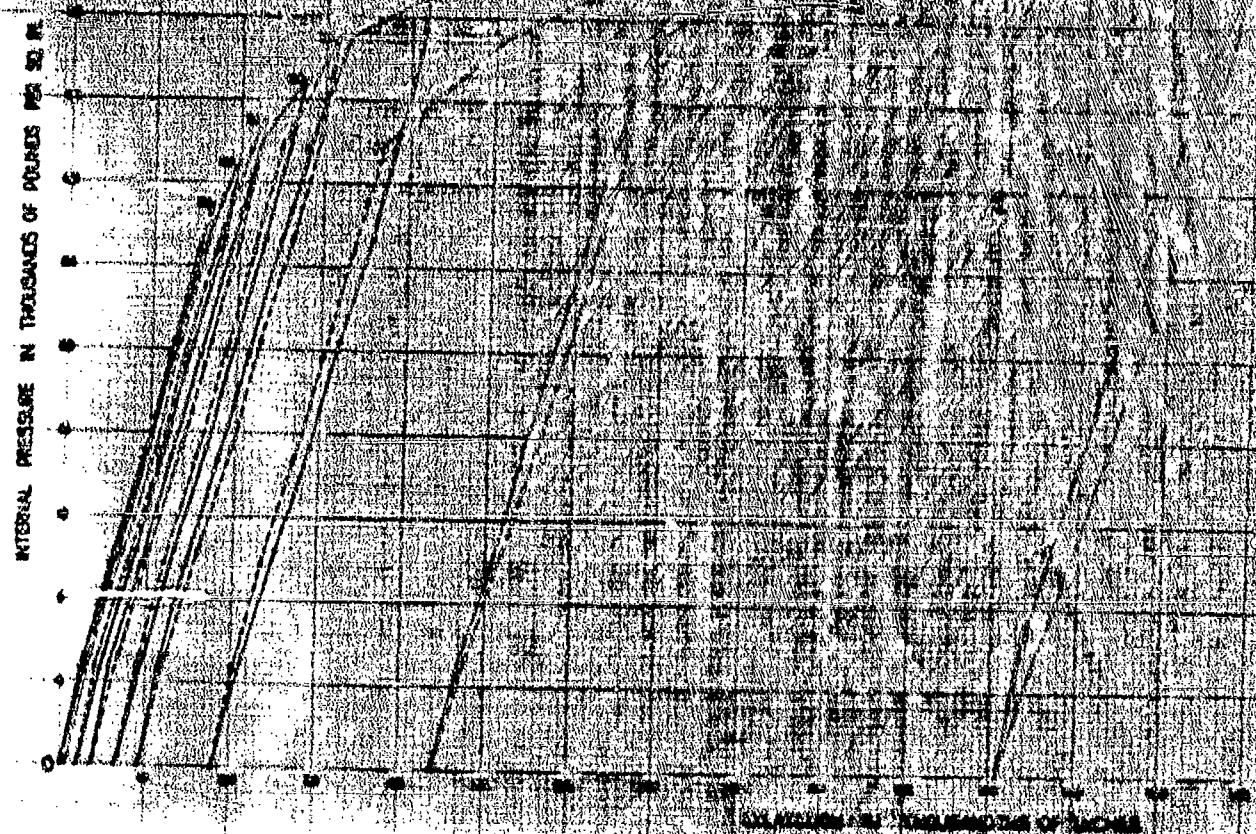
WPA.639-6725



WTN.630-6720

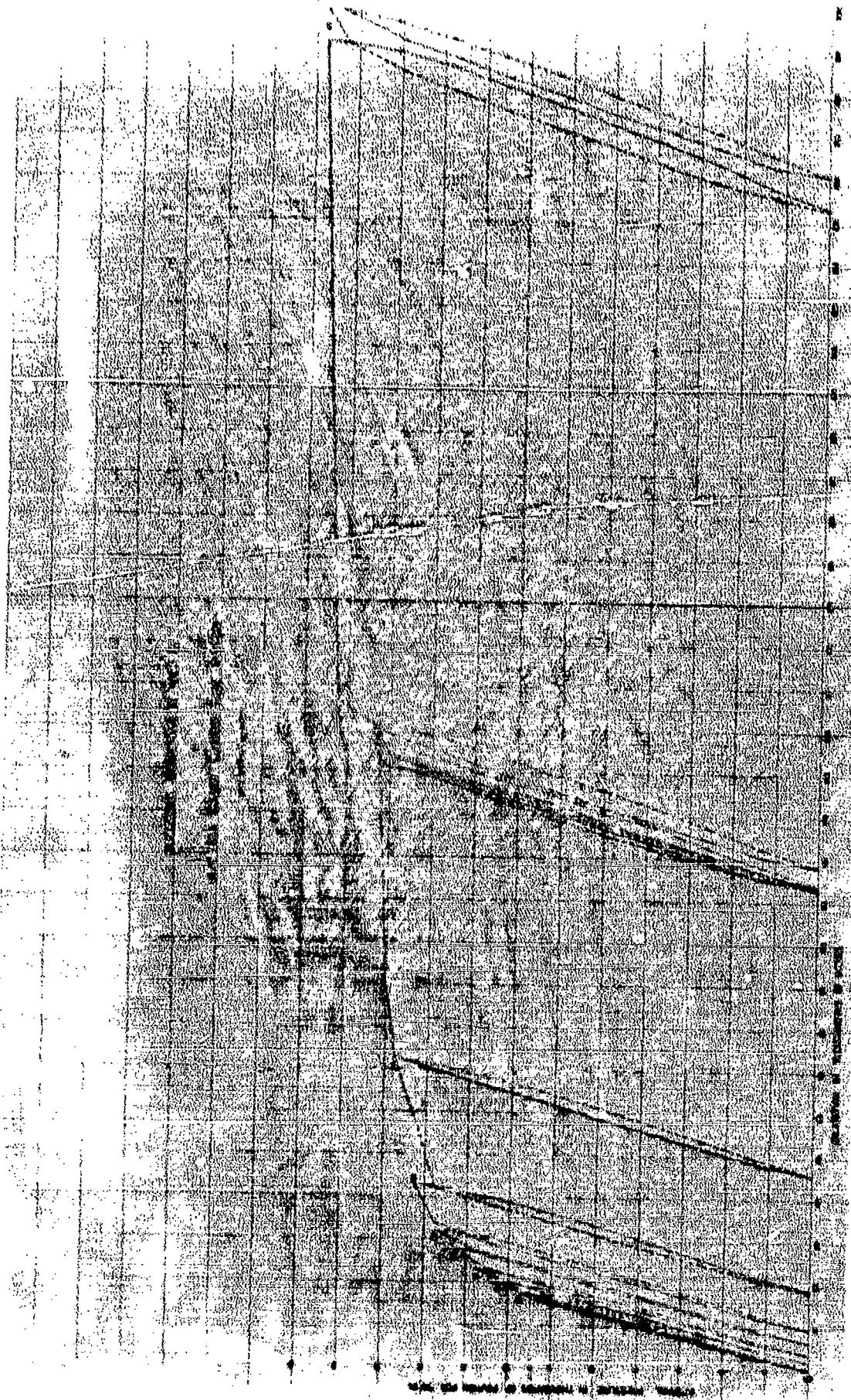
42

INTERNAL PRESSURE IN THOUSANDS OF POUNDS PER SQUARE INCH



WTN.630-6731

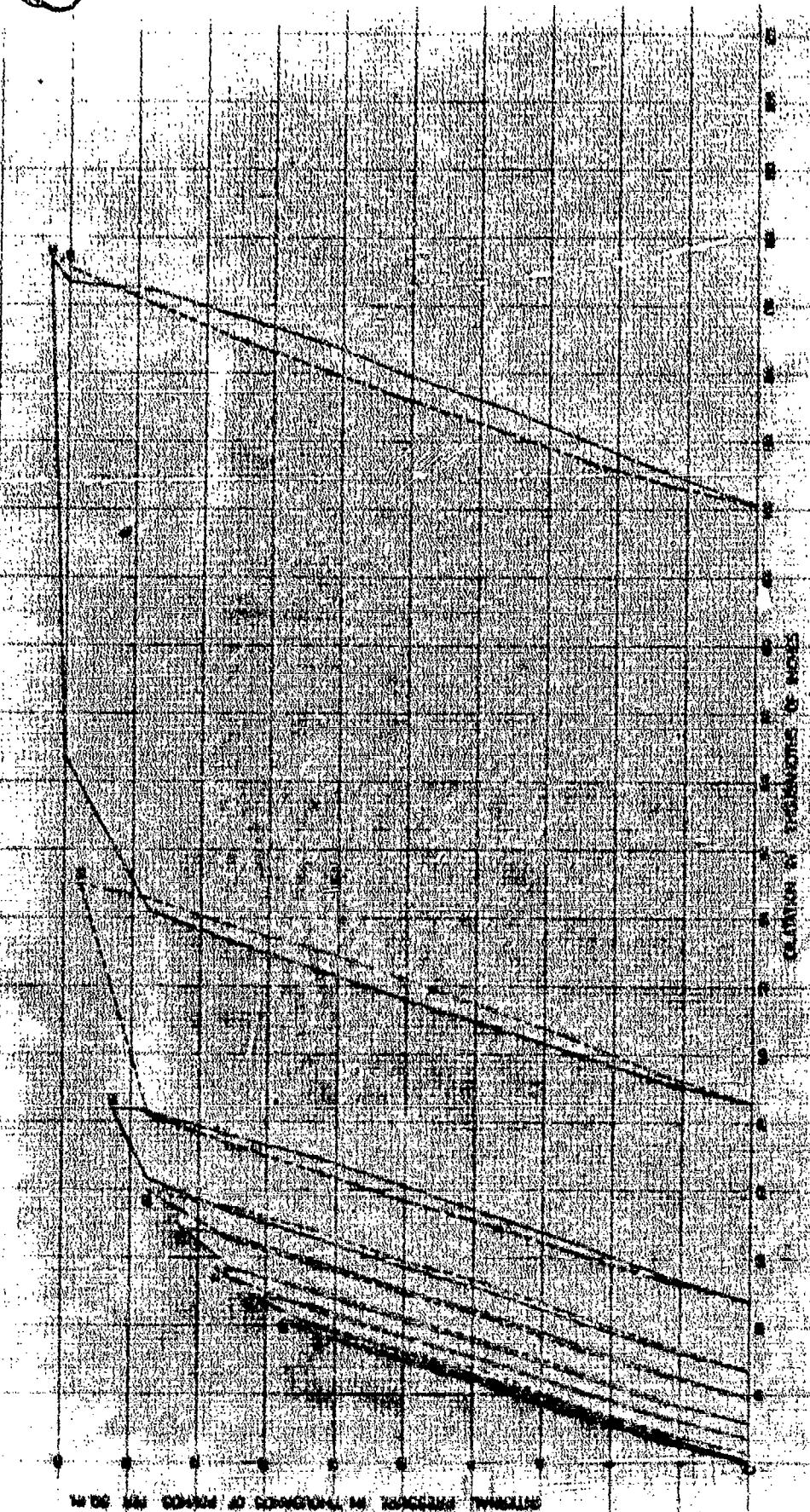
(43)



WPA.630-6732

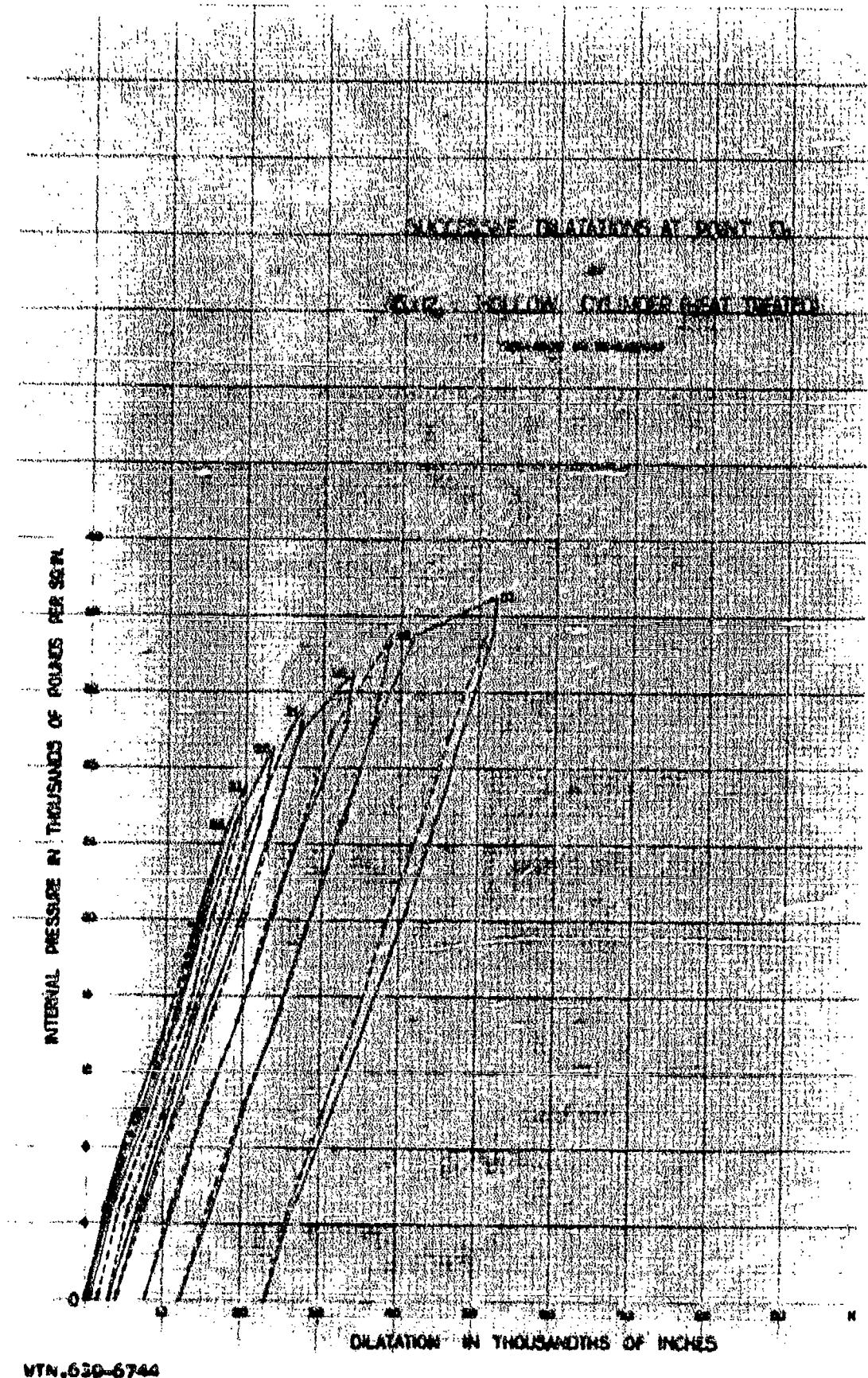
SUCCESSIONAL LATITUDES AT POINT B.

ANP-405, MOLSON GLACIER, NEAR THE HEAD

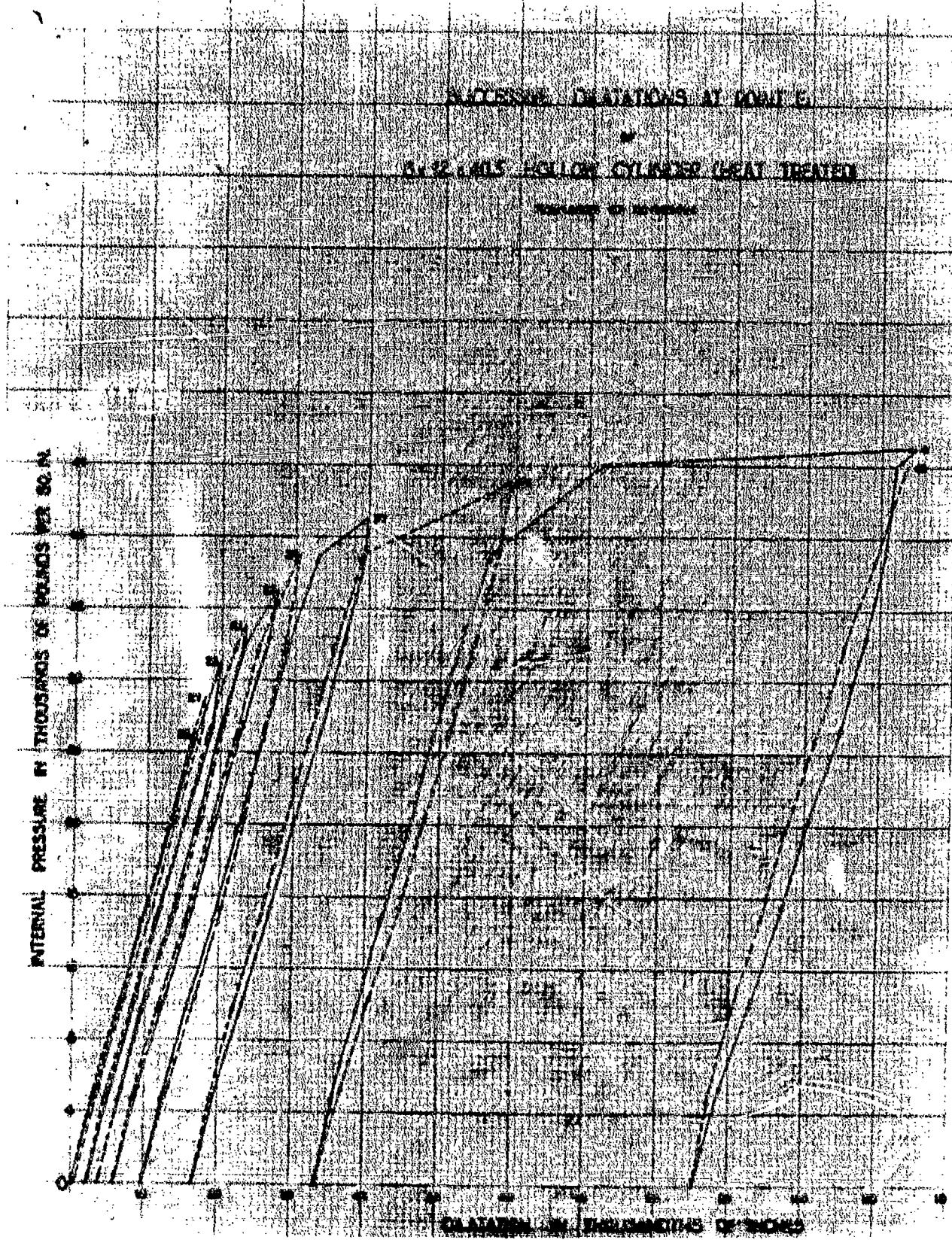


1000 800 600 400 200 0 1000 800 600 400 200

NORTH 600 675



WTN.630-6740



VTN .630-6748

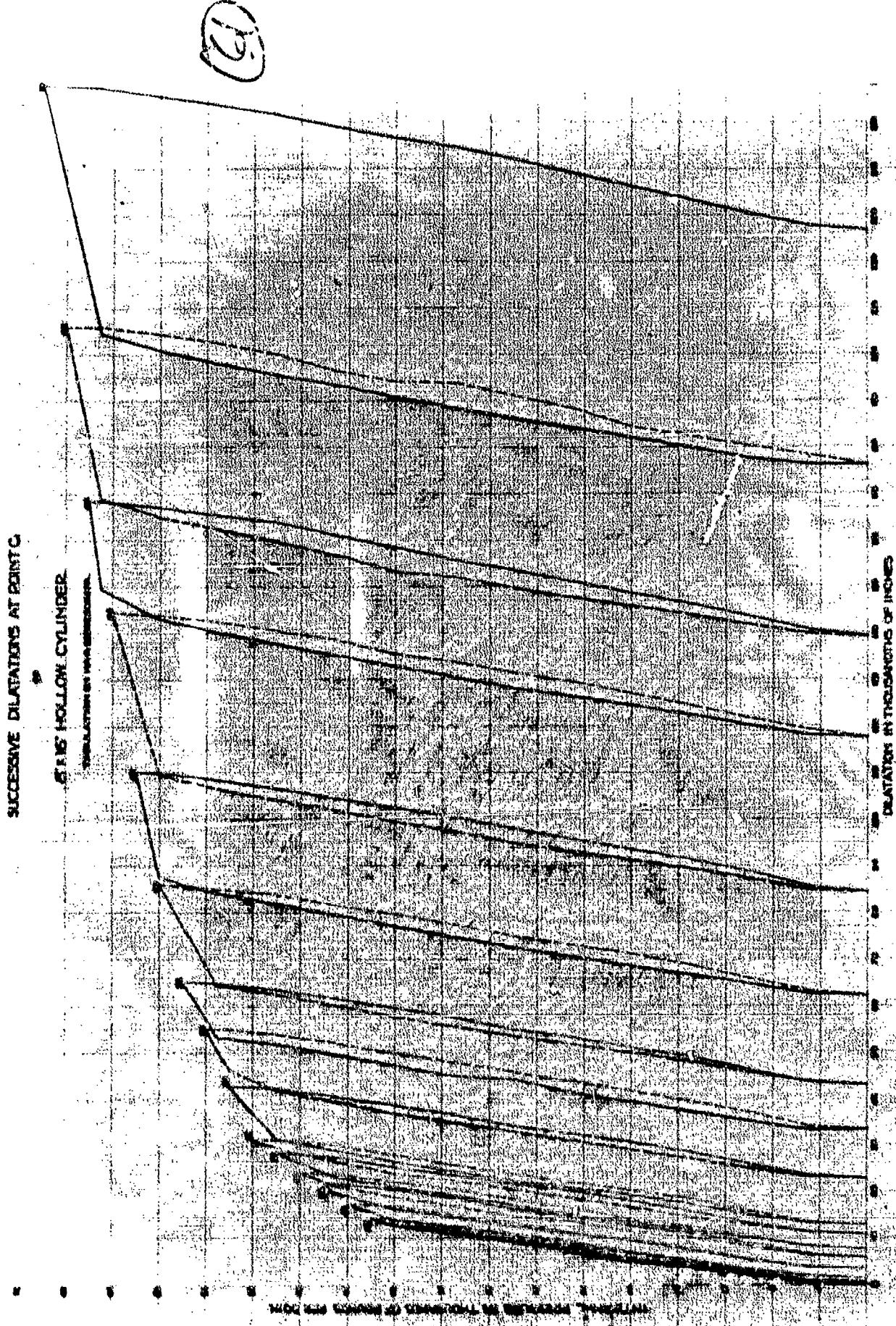
(60)

SUCCESSION OF EVENTS

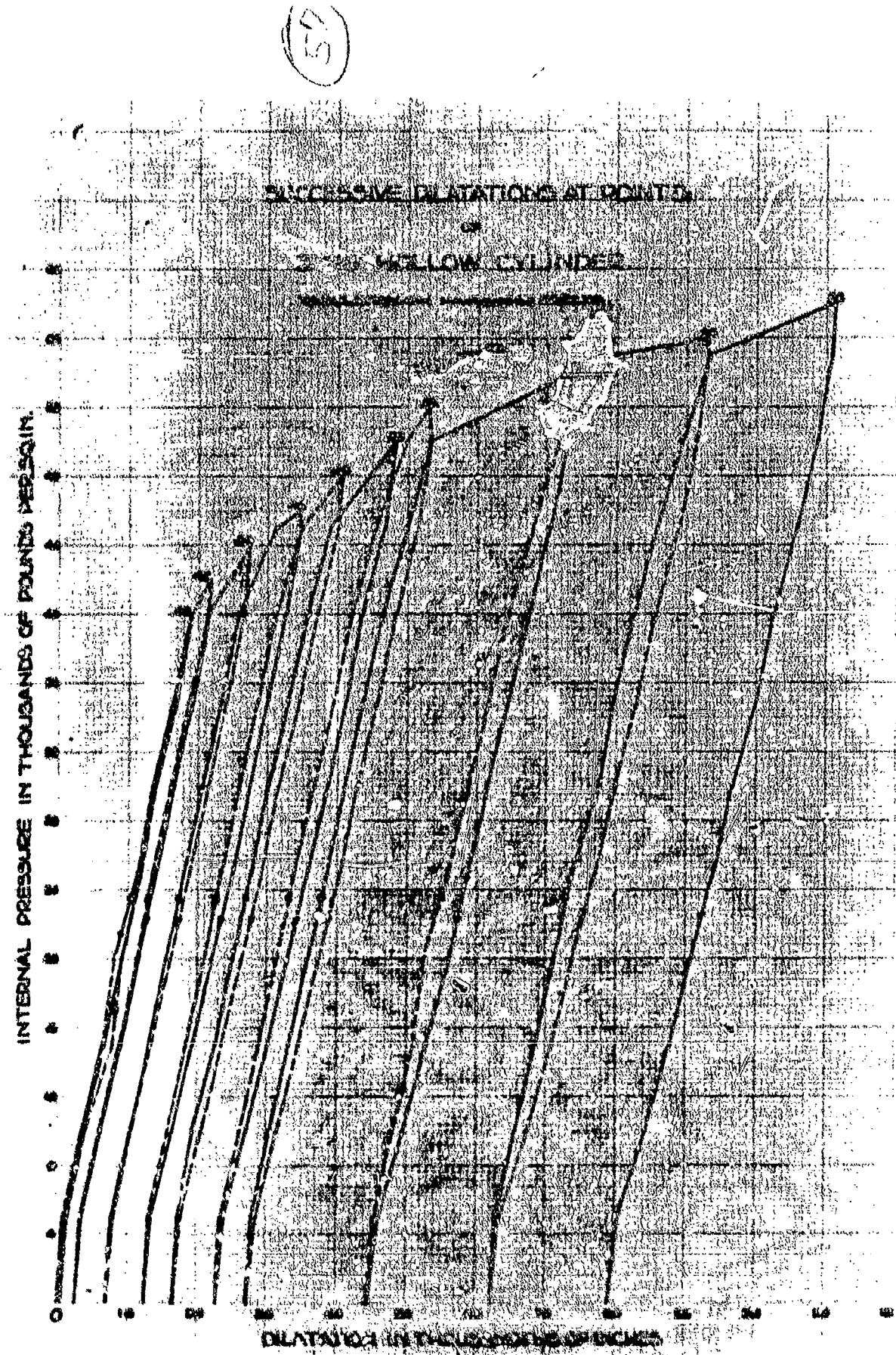
1.21.65 CYLINDER HEAD REACHED

WHEELS

WTN.639-6749



WTN 639-6750



WTN.639-6748

SUCCESSIVE DILATATIONS AT POINT C.

STATION MOLLY CYLINDERS

(55)

UTN.610-6747

104
104

SUCCESSION OF DRAUGHTS AT 10 FT.

EXC. HOLLOW CYLINDER

WINDS AND CURRENTS IN THE CHANNELS OF VARIOUS CHANNELS

WPA-632-6763

674-639-6754

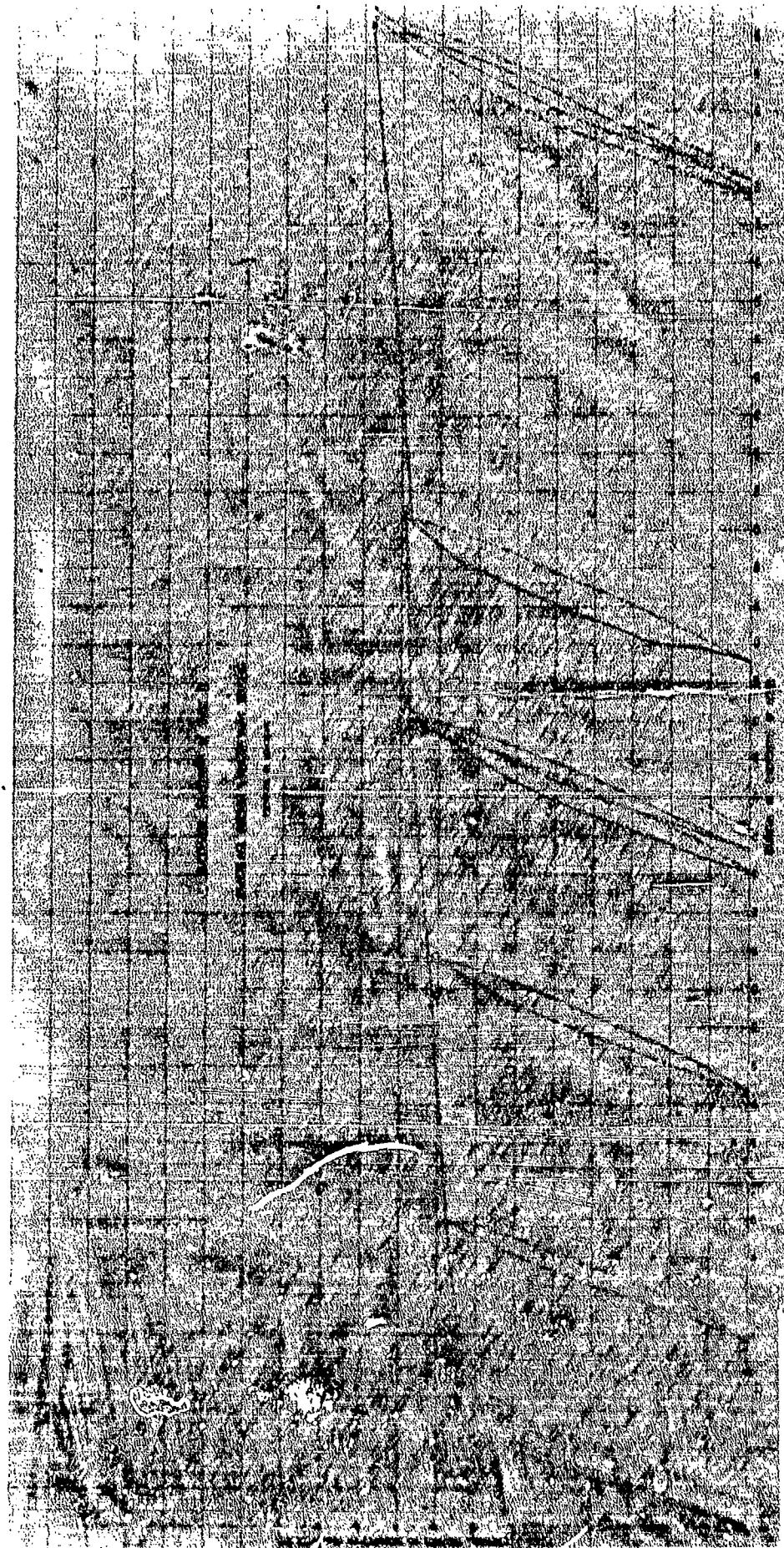
SUCCESSION PLANNING & RETIREMENT

ESTATE PLANNING CONFERENCES

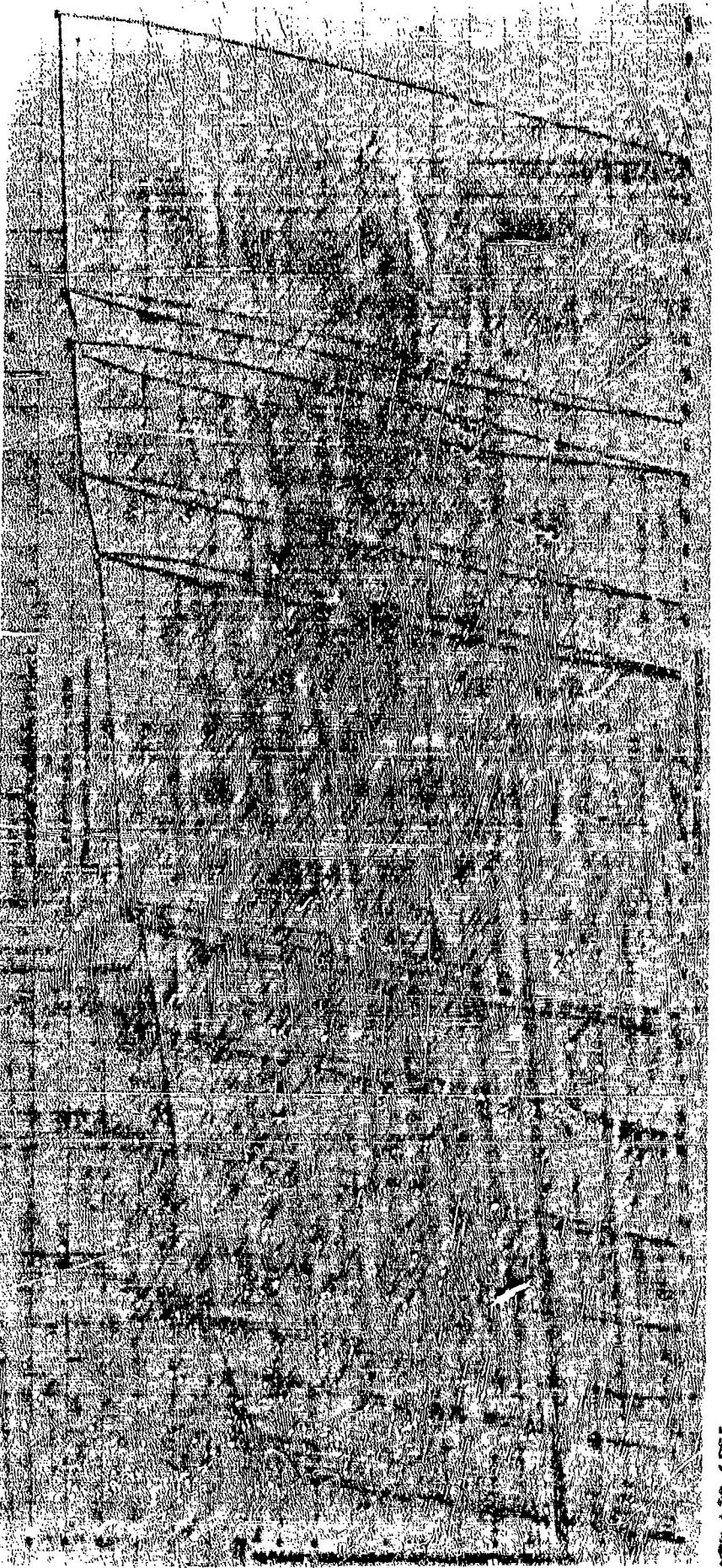
INVESTMENT

675

(C2)



(66)



63-15357-2

BLADDER AND BONES OF ANTEATER

COLLECTED IN CHINA

BY DR. C. L. DODD

IN 1890

63

63

11

10

9

8

7

6

5

4

3

2

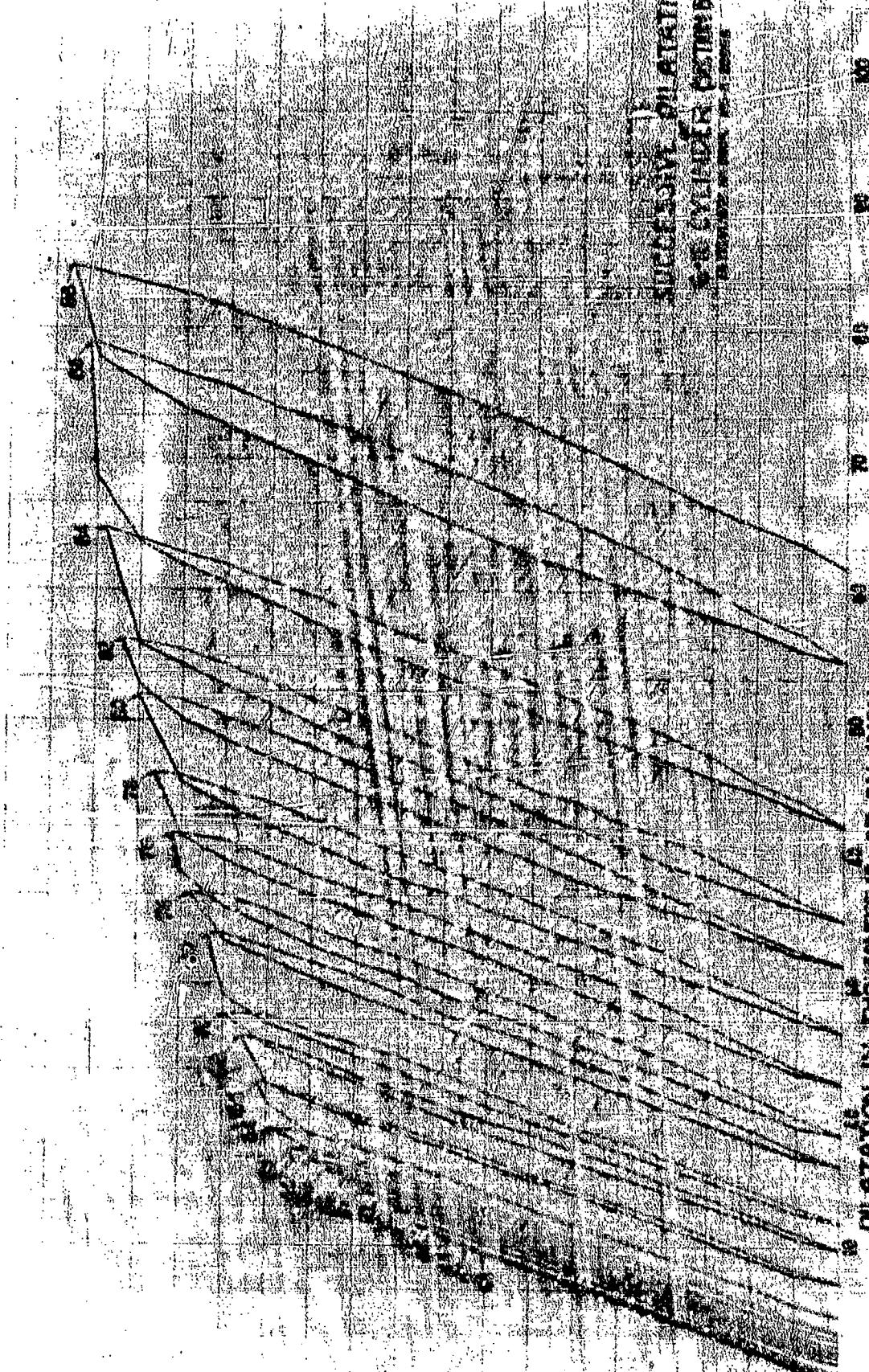
1

DATA SHEET NO. 6

CHART OF CUMULATIVE PROPORTIONAL DISTRIBUTIONS

INCHES OF PRECIPITATION IN THOUSANDS OF MILLIMETERS PER 50 MM

64



(65)

STRUCTURE VIBRATIONS
ELECTRONIC

05 08 01 09 10 02 04 06
N100 N101 N102 N103 N104 N105 N106 N107

STR.632-6754

三

CHANGES IN DIAPHRAGM

11

十一

13

10

三

三

三

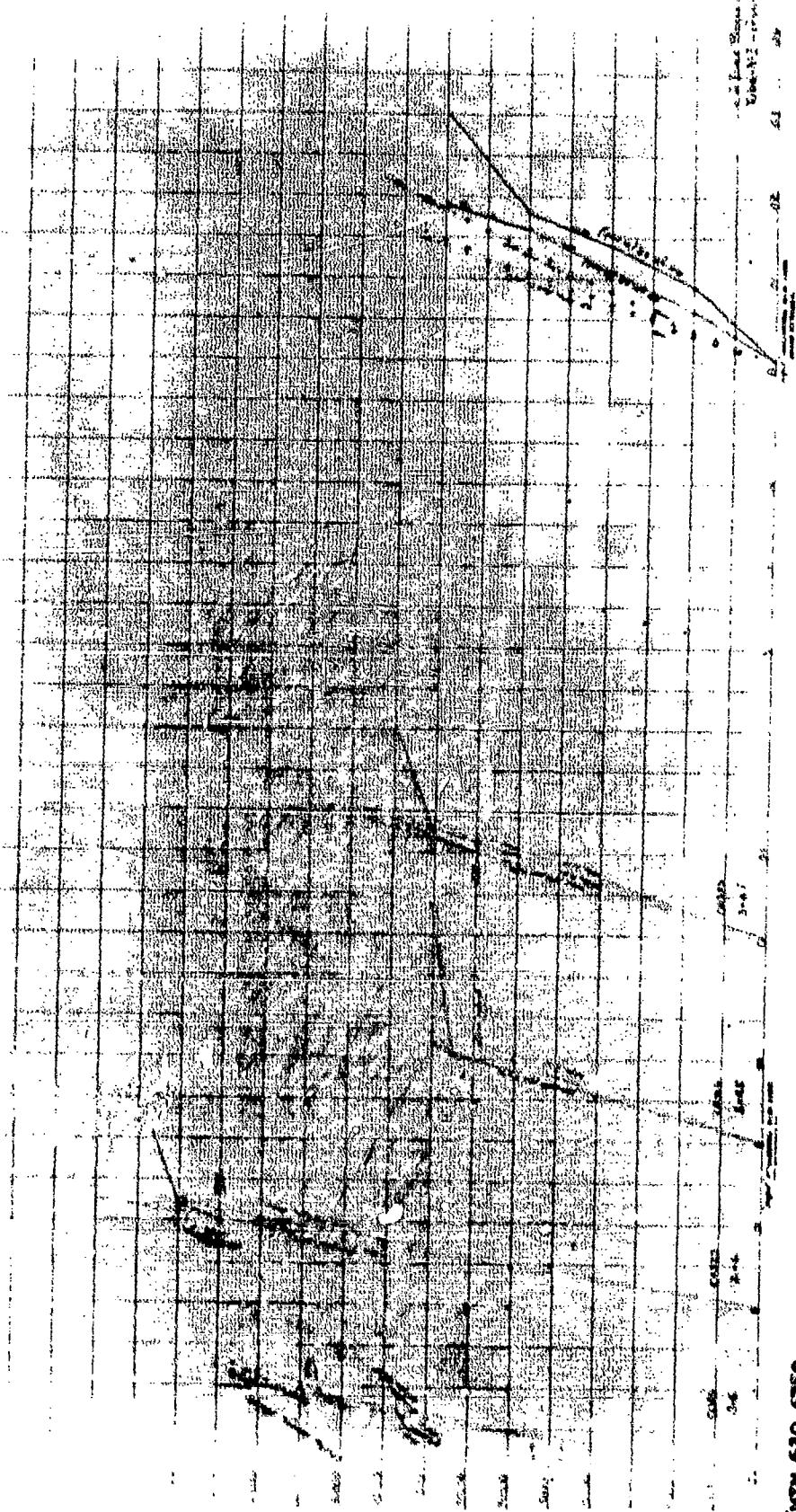
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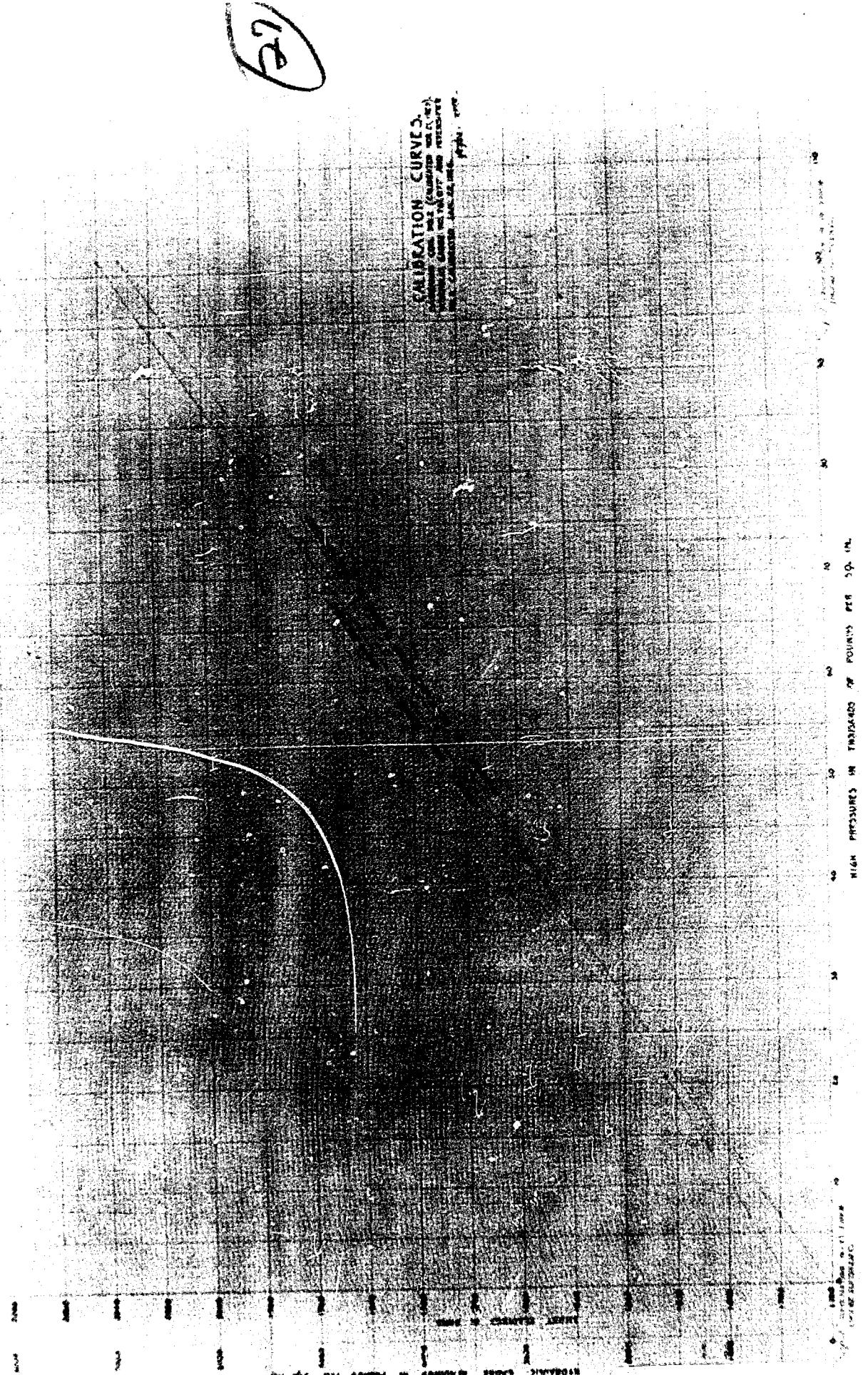
三

06 DD
N/05 12 1990 10 00 AM W/SCANNING

101-6339-6722

70





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2400

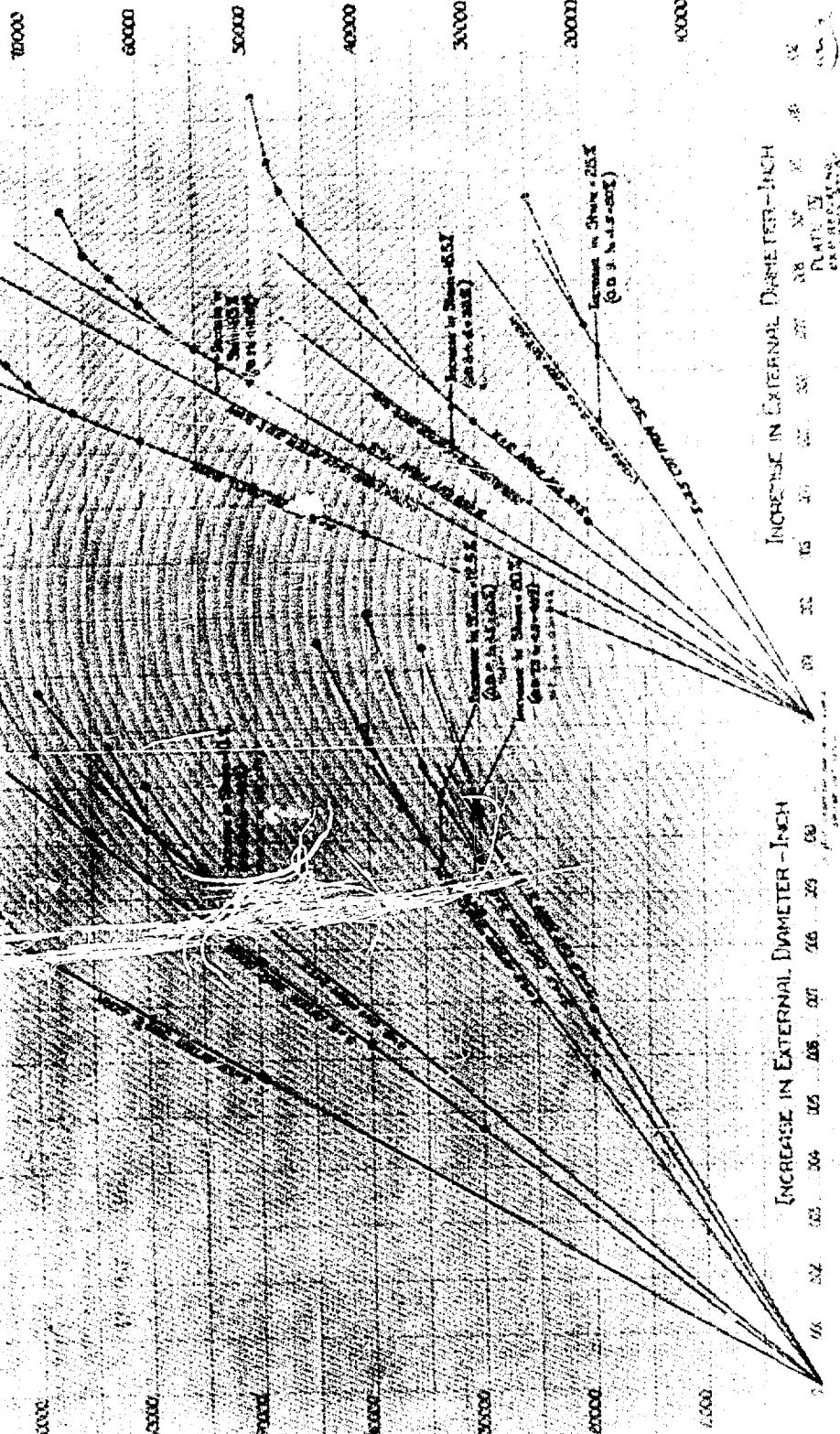
FORGEING
EL-4400-4700

FORGEING
U-CASED - C1 - 10000-40000
• C4503 - C4540-7000

6733

7000

PROCESSED - POLISHED 1/2" SQUARE INCH



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End

WNA.630-6758

100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000

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PIA/C-III
PIA/C-IV

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(6)

SP-101
SOLAR SYSTEM
REVIEW AND SUMMARY
OF THE SOLAR SYSTEM
AND PLANETARY SCIENCE